SEP 2 1885
418-21
CITY OF WASHINGTON

THE AMERICAN ARCHITECT AND BUILDING NEWS

A WEEKLY JOURNAL OF CONSTRUCTIVE AND DECORATIVE ART.

VOL. XVIII.—No. 505.] SATURDAY, AUGUST 29, 1885. PRICE, { REGULAR ISSUE, 15 CENTS. / GELATINE " 25 "

BARTLETT, HAYWARD & CO.
(Established, 1836.)
ARCHITECTURAL IRON-WORK,
HOT-WATER HEATING.
Plans and Specifications and the Superintendence of the Heating and Ventilation of Public Buildings a specialty.
BALTIMORE, MD.

W. & J. SLOANE,
ARTISTIC CARPETINGS,
—AND—
UPHOLSTRY GOODS,
ANCIENT AND MODERN ORIENTAL RUGS.
BROADWAY, EIGHTEENTH AND NINETEENTH STS.
NEW YORK.

JAMES P. WOOD & CO.
JAMES P. WOOD. JOSEPH WOOD.
STEAM-HEATING, VENTILATING, AND COOKING APPARATUS, ETC.
39 SOUTH FOURTH STREET, PHILADELPHIA, PA.

MITCHELL, VANCE & CO.
Designers and Manufacturers of
GAS FIXTURES,
ORNAMENTAL METAL WORK, CLOCKS AND BRONZES.
ARCHITECTS' ORDERS SOLICITED.
Special designs submitted on application.
WAREROOMS, 836 and 838 BROADWAY,
MANUFACTORY, 24th and 25th STS. and 10th AVENUE,
NEW YORK.

T. ASPINWALL & SON,
TILES of all descriptions for Floors, Walls, Hearths, Fireplaces and Decoration generally.
MANTELS, GRATES, AND OPEN FIREPLACES.
BRASS FENDERS, ANDIRONS, ETC.
Sole Agents for, and only direct importers of MINTON'S and the CAMPBELL TILE CO.'S TILES.
75 & 77 W. 23d St., (Masonic Temple) NEW YORK.

SEYSSEL ROCK ASPHALT.
FOR SIDEWALKS, FLOORS, CELLARS, ROOFS, ETC.
BITUMEN DAMP COURSE.
DAMP RESISTING SOLUTION.
ACTINOLITE ROOFS,
29 Waverley Place, NEW YORK. E. H. WOOTTON N. Y. Mastic Works. Arcade Bldg, E'ms 14, 16 & 17, CHICAGO.

J. W. TAYLOR, CHICAGO. 146 LA SALLE ST.
NEW ARCHITECTURAL PHOTOGRAPHIC SERIES.
Send for Circulars, and Club rates on American and Foreign Periodicals.

OHIO BUILDING STONE CO.
QUARRYMEN AND DEALERS IN
BUFF AND BLUE OHIO SANDSTONE.
OFFICES:
127 SUPERIOR STREET, CLEVELAND, O.
BRANCH OFFICES:
247 BROADWAY, NEW YORK, N. Y.
350 FIFTH AVENUE, CHICAGO, ILL.
49 FIFTH AVENUE, PITTSBURGH PA.

J. F. DALTON, [Established 1876.]
GAS-PIPING,
106 SUDBURY STREET, BOSTON, MASS.
Invitations for estimates solicited.

Established 1871.
CHARLES R. YANDELL & CO.,
IMPORTERS AND MANUFACTURERS
CABINET FURNITURE.
DECORATIVE PAINTERS.
Specialities:
Illuminated Leathers, Hand Painted Wall-Papers, Cordova Chairs, Curtains and Textile Fabrics.
Modelled Fibrine, a new patented material for ceilings and walls.
No. 6 EAST EIGHTEENTH STREET, FIFTH AVENUE, NEW YORK.

WHITTIER MACHINE CO.
Manufacturers of Steam and Hydraulic
ELEVATORS,
STEAM ENGINES, BOILERS, AND MACHINERY.
1176 TREMONT ST., BOSTON.
NEW YORK OFFICE, 91 LIBERTY STREET.
CHAS. WHITTIER, *Pres't.* A. C. WHITTIER, *Treas.*

L. S. GRAVES & SON,
PASSENGER AND FREIGHT
ELEVATORS.
NOISELESS, SAFE AND DURABLE
CENTRE STREET, ROCHESTER, NEW YORK.
NEW YORK OFFICE, 46 COURTLAND STREET.

STOKES & PARRISH,
30th & CHESTNUT STS., PHILADELPHIA, PA.
Hydraulic and Steam-Power
ELEVATORS.
SAFETY, SPEED, AND ECONOMY.
All kinds of Hoisting Machinery a specialty.
NEW YORK OFFICE, - - 95 & 97 LIBERTY STREET.

OTIS
PASSENGER AND FREIGHT
ELEVATORS,
A SPECIALTY FOR A QUARTER OF A CENTURY.
For Hotels, Office-Buildings, Stores, Warehouses Factories. Mines, Blast-Furnaces, etc
OTIS BROTHERS & CO.,
NEW YORK, BOSTON, AND PHILADELPHIA.

CRANE'S
ELEVATORS,
CHICAGO WORKS, 10 N. JEFFERSON STREET.
NEW YORK OFFICE, 40 & 42 Wall St. BOSTON OFFICE, R'm 80 Mason Build.
PITTSBURGH, PA., 111 Water St., CLEVELAND, OHIO, Blackstone Build.
ST. LOUIS, MO., Cor. 5th & Chestnut Sts. MINNEAPOLIS, MINN. Hennepin Block.

MOORE & WYMAN,
ELEVATOR
—AND—
MACHINE WORKS.
37 FOUNDRY STREET, BOSTON, MASS.

SPANISH TILES "NOLLA'S."
The best colors and hardness ever produced in Flooring Tiles. *Original Designs for every Work.*
FERNANDO MIRANDA, Sole Agent in U. S.
92 Liberty Street, New York, N. Y.

THE UNITED STATES ENCAUSTIC TILE CO., Indianapolis, Ind.
PLAIN, GEOMETRICAL & ENCAUSTIC TILES, FOR FLOORS
Public Buildings and Private Residences.
HIGH ART MAJOLICA TILES for Mantel Facings, Friezes, Furniture, etc.
GLAZED AND ENAMELLED TILES for Hearths, Stoves, Wainscoting, etc.
Designs and Estimates furnished upon application.
NEW YORK OFFICE: 228 WEST 23d STREET.

CONSERVATORIES,
GREEN-HOUSES,
GRAPERIES,
SKYLIGHTS,
Erected and Glazed on Rendle's Patent "Acme" System.
Gold and Silver medals have been awarded to the two Model Conservatories, each 16 x 20 feet, exhibited at the World's Exposition, New Orleans.
Estimates, Plans, Illustrated Catalogue, on application to
ARTHUR E. RENDLE,
RENDLE'S HORTICULTURAL AND SKYLIGHT WORKS,
92 BROADWAY, COR. WALL ST., NEW YORK.
The Horticultural Hall, New Orleans, was erected and glazed by me.

AMERICAN ENCAUSTIC TILE.
Acknowledged by experts to be
THE BEST IN THE WORLD.
Manufactured by the
AMERICAN ENCAUSTIC TILING CO. (Limited.)
OFFICE & SALESROOM, 116 WEST 23D ST., N. Y.
Designs and Estimates for Public Buildings, Halls, Churches, Vestibules, and for External Decoration, Bath-room, Stove, and Furniture Decorations.
GLAZED AND ENAMELLED TILES
FOR MANTELS, HEARTHS, WAINSCOTING, ETC.

MINTON'S TILES.
PLAIN AND ENCAUSTIC,
FOR PUBLIC BUILDINGS AND DWELLINGS,
As laid by us in
THE CAPITOLS AT WASHINGTON & ALBANY,
And in numerous Churches, Banks, and Dwellings in every part of the country.
Glazed and Enamelled Tiles for Mantels, Hearths, Wainscoting, etc., and for Exterior Decoration.
MILLER & COATES,
279 PEARL STREET, NEW YORK.

FLYNT
BUILDING AND CONSTRUCTION CO.,
GENERAL OFFICE, PALMER, MASS.
Contracts made for furnishing all material and labc necessary to build complete
MILLS, HOTELS, CHURCHES,
BUSINESS BLOCKS and RESIDENCES
Also, for the construction of
RAILROADS, DAMS, AND BRIDGES.
We make Mill-Work a Specialty.
Can show some of the best Mill-Work in New Eng land. Can give the best of references, and should pleased to correspond with parties in any locality.

MANHATTAN BRASS CO.,
28th ST. AND FIRST AVENUE, NEW YORK.
HOUSEHOLD ART GOODS
IN METAL.
FIRE GOODS AND BRASS TRIMMINGS OF ALL KINDS.
Catalogues furnished on application.

ROBERT C. FISHER,
Successor to FISHER & BIRD,
MARBLE AND GRANITE WORK
97, 99, 101 and 103 EAST HOUSTON STREET.
Established 1830. NEW YORK

POPULAR BECAUSE RELIABLE.

AUSTIN'S PATENT

Expanding Conductor,

OR LEADER.

The ORIGINAL and only LEGITIMATE EXPANDING CONDUCTOR in the market, has been used for years and THOROUGHLY TESTED in all the PRINCIPAL CITIES and TOWNS in the UNITED STATES and is SPECIFIED by ARCHITECTS generally THROUGHOUT THE COUNTRY.

Austin, Obdyke & Co., Philadelphia,

SOLE MANUFACTURERS.

PRINCIPAL AGENTS.

S. D. Hicks & Son,	Boston.	B. G. Carpenter & Co.,	Wilkesbarre, Penn.
M. Halliday,	New York City.	The Miller Iron Co.,	Providence, R. I.
Bruce & Cook,	"	Theodore Macknet & Co.,	Newark, N. J.
Sidney Shepard & Co.,	Buffalo, N. Y.	Knisely & Miller,	Chicago.
Wasson & Co.,	Albany, N. Y.	J. C. McFarland,	Chicago, Ill.
Hoy & Co.,	Albany, N. Y.	Wm. Fuller & Co.,	Baltimore, Md.
Reardon & Ennis,	Troy, N. Y.	The Blodgett & Clapp Co.,	Hartford, Conn.
Troy Stamping Works,	Troy, N. Y.	Bakewell & Mullins,	Salem, Ohio.
Chas. Millar & Son,	Utica, N. Y.	Biersack & Neidermeyer,	Milwaukee, Wis.
W. H. Scott,	Portland, Me.	Jas. B. Scott & Co.,	Pittsburgh, Pa.
J. W. Jordan,	Worcester, Mass.	C. S. Mersick & Co.,	New Haven, Conn.
Lewis Dauth,		Reading, Pa.	

CARD.

By decisions of the U. S. Circuit Courts the *Exclusive Right* to manufacture *Expanding Conductors of any and all designs*, was secured to WILLIAM AUSTIN, and AUSTIN, OBDYKE & Co. are the only parties authorized to manufacture under Austin's Letters Patent,—all others will be considered and treated as

INFRINGERS.

THE ONLY REAL

EXPANDING CONDUCTOR.

—Guaranteed no Infringement.—

THE IRWIN & REBER

PATENT

EXPANDING WATER CONDUCTOR.

MANUFACTURED BY THE

S. S. S. Conductor Co.

LIMITED,

163 Lacock Street,

ALLEGHENY, PA.

THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the eave pipe or head, run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.

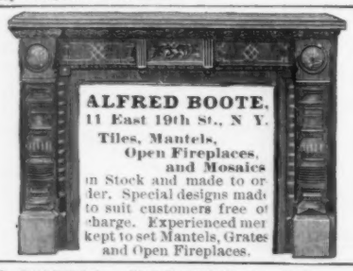
Made in 6-foot lengths, in a single sheet of

SOFT STEEL,

Either Galvanized, Kalameined or Leaded.

PRINCIPAL AGENTS.

E. B. Badger & Son, Boston, Mass.; Noyes & Wines, New York; J. S. Thorn, Philadelphia; John G. Hetzell, Baltimore; R. P. Gormully, Chicago; F. Schmitt & Sons, Milwaukee; Shackelton Bros., Cleveland; G. H. Peters & Son, Buffalo, N. Y.; James Ackroyd, Albany, N. Y.; Witt & Brown, Cincinnati; Hull & Coxens Man'f'g Co., St. Louis, A. K. Sweet, Kansas City Mo., and many others.



ALFRED BOOTE,

11 East 19th St., N. Y.

Tiles, Mantels, Open Fireplaces, and Mosaics in Stock and made to order. Special designs made to suit customers free of charge. Experienced men kept to set Mantels, Grates and Open Fireplaces.

MINTON, HOLLINS & CO

STOKE-UPON-TRENT

The original and existing Manufactory of

MINTON'S

Plain, Encaustic, Glazed, Enamelled, Majolica, Printed and Art-Painted Tiles, for Floors, Walls, Hearths, Mantels, Furniture, &c. Illustrated sheets of newest designs just issued.

SHARPLESS & WATTS, Agents,

No. 1325 MARKET STREET, PHILADELPHIA, PA.

A. L. FAUCHERE & CO

Office and Warerooms,

433 AND 435 SEVENTH AVENUE, next to south-east corner Thirty-fourth Street,

Importers, Manufacturers, and Dealers in all kinds of

FOREIGN AND DOMESTIC

MARBLE FOR INTERIOR WORK.

Estimates furnished on application.

A STANDARD

Speaking-Tube.

Architects and Builders, who wish to make sure of getting a thoroughly reliable article can secure it by specifying our new machine-made

LOCK-SEAM SPEAKING-TUBE.

LAMB & RITCHIE,

Boston Spiral Tube Works,

Cambridgeport, Mass.

Stained Glass.

W. J. McPHERSON,

PLAIN, DECORATIVE, DOMESTIC AND ECCLESIASTICAL

Stained & Leaded Glass Manufacturer.

440, 442 & 444 TREMONT STREET.

JAMES BAKER & SONS,

PROFESSIONALS IN

ART STAINED GLASS.

Established, London, Eng., 1854.

WORKS: 20 West 4th Street, New York.

CLEVELAND

Stained Glass Works.

GEO. DRAKE, Proprietor,

99 and 101 Public Square, Cleveland, Ohio.

Decorative Glass Manuf'g Co.,

218 WABASH AVE., CHICAGO.

Stained Glass by newly discovered processes at a fraction of former cost. Not an imitation. Send for Circular.

WILLIAM WRIGHT,

Interior Decorator,

STAINED GLASS.

Designer and Manufacturer of Fine Furniture, Rich Paper Hangings.

34 Fort Street, West, - - DETROIT, MICH.

Stained Glass.

SAMUEL WEST,

471 Tremont St., Boston,

Artist in Stained Glass

FOR ALL GRADES OF ORNAMENTATION.

Memorial Windows a specialty.

Awards of the highest merit for thirty years past.

METAL WORK IN BRASS, BRONZE, and STERLING SILVER.

J. & R. LAMB, 6th Ave. Cars pass the door.

59 CARMINE STREET, NEW YORK.

Send for Hand-Book, by mail.

New Designs in MOSAIC and JEWELED FIGURE-WORK. STAINED GLASS

McCULLY & MILES,

STAINED GLASS

1-3-5-7 & 9 MADISON STREET

Corner Michigan Avenue,

CHICAGO, - - ILL

ALFRED GODWIN & CO.

STAINED GLASS

For Churches, Dwellings, &c.

Send for Illustrated Catalogue.

1201 Market Street, Philadelphia.

REDDING, BAIRD & CO.,

Manufacturers of

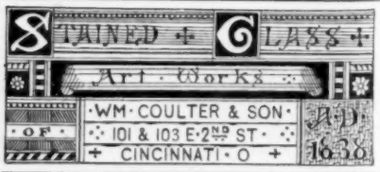
Stained Glass.

IMPORTED

ROLLED CATHEDRAL GLASS

Office and Show-Room:

152 Franklin Street, Boston.



Donald MacDonald, Agt.,

Glass Stainer and Decorator.

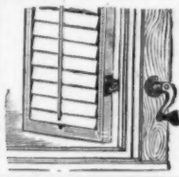
Studio and Works, 400 Northampton St.

J. G. & J. F. LOW,
CHELSEA, MASS.
New York Retail Office, 9 E. 17th St.
REPRESENTED BY
Chicago, Henry Dibblee & Co., 266-268 Wabash Ave.
Albany, Richard Wickham.
Boston, C. A. Wellington & Co., 44 Boylston St.
Buffalo, Malcolm, Wolsley & Co.
Cincinnati, C. S. Rankin & Co., West Pearl St.

LOW'S ART TILES.

Cleveland, A. S. Herenden Furniture Co., Bank St.
Washington, Hayward & Hutchinson, Ninth St.
San Francisco, W. W. Montague & Co., Market St.
Minneapolis, Sullivan & Farnham, Third St., So.
Omaha, Milton Rogers & Sons, Farnam & 14th Sts.
Louisville, J. V. Escott & Sons, Fourth Ave.
St. Louis, Seidel & Schoenle, So. Fifth St.
Milwaukee, Mathews Bros.
Phila., W. H. Harrison & Brother, 1435 Chestnut St.
Pittsburgh, L. H. Smith & Co., 49 Sixth St.
Rochester, Hayden & Havens Co.
Syracuse, Hawley, Whitaker & Co., 83 S. Salina St.

J. PASQUALI & C. AESCHLIMANN,
Manufacturers of Roman and Venetian
Marble Mosaics,
For Floors, Walls, Ceilings, Mantels, Hearths, Decorations, etc. **231 East 28th St.,** Bet. 2d & 3d Aves. N. Y. Prices very moderate. *References:* Principal Architects and decorators of N. Y. *Note.*—A party advertising to have superintended all work of this nature in N. Y. has never superintended any work there.



Window Blind Worker.
Opens and closes the blinds without opening the window. Blinds held firm in any position. Perfect in operation; so constructed that neither ice, frost nor rust affect them.
DODD & RICE MFG CO.,
Hudson, N. Y.

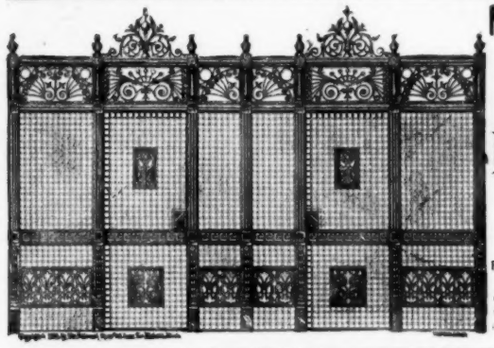
Decorators.
FRANK HILL SMITH,
62 BOYLSTON STREET,
BOSTON..... .....MASS.

H. EDCAR HARTWELL & CO.,
Designers and Art Furnishers,
28 West 23d Street, N. Y. CITY. | 1416 F Street, WASHINGTON, D. C.
FURNITURE, STAINED GLASS AND FRESCOES.
Houses and Churches Furnished Throughout.

W. J. McPHERSON,
Established A. D., 1845,
Painter, Glazier, Designer, an Ecclesiastical
DECORATOR.
440, 442 and 444 Tremont Street.

ARTISTIC TILES
FOR WALLS, FIRE-PLACES AND FLOORS
OF PUBLIC BUILDINGS AND PRIVATE RESIDENCES. Manufactured by
The International Tile Co., (Limited.)
New York Office and Show Rooms: 8 East 17th Sreet.
Works, Third St., between Hoyt and Bond St.

C. H. GEORGE & CO., **Importers.**
PAPER HANGINGS.
Exclusive Upholstery Goods and Decorations.
152 5th Avenue, New York.



National Wire & Iron Co.,
DETROIT, MICH.
Manufacturers of
Iron, Wire and Brass
Elevator Enclosures.
We have recently furnished the new **Board of Trade and Royal Insurance Buildings,** of Chicago, Ill., with Iron and Brass Elevator enclosures, to which we point as a standing reference. Write for estimates and particulars.

Established A. D. 1848.
L. HABERSTROH & SON,
Mural Decorators,
PAINTING IN ALL ITS BRANCHES.
28 School Street, Rooms 10 & 11, **Boston, Mass.**
20 Bellevue Ave., Near Kay St., **NEWPORT, R. I.**

HELIOTYPE.
Photo-Mechanical Printing.—For the reproduction in printer's ink, on the printing-press, of Portraits and Views from Nature and all descriptions of PHOTOGRAPHIC work.
Photo-Lithography.—For the reproduction of Artists', Architects', Engineers', Surveyors', and other Drawings from originals in black and white.
Photo-Engraving and Zinc Etching.—For the production of cuts to print with type, from originals in black and white.
Photo-Caustic Printing.—For the lithographic reproduction of photographic subjects, without redrawing.
Lithography. Of all classes.
Chromo-Lithography.
Direct Transfer.—A patented process for the speedy reproduction (from originals made with ordinary ink on ordinary paper) of autograph letters, sketches, caricatures, etc., either as cuts or lithographs.
The Heliotype Printing Company, 211 Tremont Street, Boston, Mass.

Artists of the Nineteenth Century.
By CLARA ERSKINE CLEMENT and LAURENCE HUTTON. 12mo. $3.00; half calf, $5.00; tree calf, $7.00, New and fully revised edition.
A full encyclopedia of information concerning the lives and works of modern artists of Europe and America.
"This capital modern dictionary, into which has been condensed a vast amount of information that might be sought for long, and often indeed altogether in vain, elsewhere."—*The Academy (London).*
"It is the most valuable book of its kind in the English language."—*Art Amateur.*
TICKNOR & CO., 211 Tremont St., Boston.

J. K. BRICHAM,
237 Broadway, New York.
SPANISH FLOOR AND WALL "STAR," ENCAUSTIC (American) **TILES,** Enamelled Hearths & Facings.
Spanish Mosiacs and Glazed Tiles
For Halls, Vestibules, Bath-rooms, Kitchens, etc.

LIQUID GLASS PAINT.
IT HAS STOOD THE TEST.
Of holding Kerosene Oil in Paper Barrels, Boxes, and Bags. It will absolutely hold on Wood or Iron when in salt water, or exposed to salt air, longer than any paint ever made. For Private or Public Buildings it has no equal. Made in White and all Colors. ***Warranted not to crack or rub off. Send for Circular.***
Factory, Lyme, Conn.
Office, 147 Commerce St., Hartford, Conn. } THE LIQUID GLASS PAINT CO.

E. A. HITCHCOCK, President. GEORGE F. NEALE, Manager. C. W. BARNES, Treasurer.
CRYSTAL PLATE-GLASS CO.,
MANUFACTURERS OF
POLISHED PLATE-GLASS
SKYLIGHT-GLASS, FLOORING-GLASS,
ST. LOUIS, MO.
ESTIMATES PROMPTLY FURNISHED.
GILBERT S. KING, AGENT, 102 Chambers St., Room 40, NEW YORK.

Annunciators, Electric.

EDWARDS & COMPANY,
(PATENT)
Electric Bells and Annunciators,
AUTOMATIC BURGLAR ALARMS, FIRE ALARMS, Etc.
Estimates for Electric Bells, Annunciators, Speaking-Tubes, Letter-Boxes, Door-Openers for Apartment-Houses, etc.
GAS-LIGHTING BY ELECTRICITY.
Factory: 4th Ave. and 144th St. Office: 171 Broadway, N. Y.

Architectural Iron and Jail Works.

Architectural Iron and Jail Works.
IRON STORE-FRONTS, COLUMNS AND GIRDERS,
Iron Railings and Verandas,
BANK VAULTS, FIRE-PROOF DOORS & SHUTTERS,
JAIL CELLS AND CAGES,
and all kinds of iron-work required in the erection of buildings.
M. CLEMENTS,
Catalogues furnished on application. Cincinnati, Ohio

Architectural Sheet-Metal Work.

G. L. Swett & Company,
Manuf'rs of Plain and Ornamental
SHEET-METAL WORK FOR BUILDINGS.
Copper Gutters, Cornices, Windows, Finials,
Galvanized-Iron Ventilators, Roofing, etc.
IMPROVED METALLIC SKYLIGHTS.
N. B.— We warrant our Skylights to be Fire and Storm-Proof. They are the best made and are in use by the Heliotype Printing Co., Notman Photographic Co., U. S. Sub-Treasury and Post-Office, and nearly all the principal buildings in Boston.
295 Harrison Ave., cor. Motte St., Boston.

Decorative Glass by Sand Blast.

JOHN MATTHEWS,
First Avenue, Twenty-sixth and Twenty-seventh Streets,
NEW YORK.
Sole licensee in New York of the TILGHMAN SAND BLAST.
Decorative Glass from Late Designs Executed by Sand Blast or Embossing Processes in a Superior Manner.
SHEET AND PLATE GLASS GROUND TO ORDER.
Send for Illustrated Catalogue or Estimates.

Fireplaces, Ash-Traps, and Grates.

EUREKA GRATE WORKS,
Manufacturers of
PATENT FIREPLACE LININGS,
Patent Self-closing Ash-Traps,
Grates of all kinds,
Iron Mantels, and Importers of Tiles.
CINCINNATI, OHIO.

PATENT Solid Parquet FLOORS.

PARQUET FLOORS,
Established 1874. 7-8 and 3-8 in. thick.
These are the cheapest, most beautiful and durable floor made. Thousands of them are in use in the finest residences, offices, etc., throughout the country, with perfect satisfaction. New and beautiful designs are constantly being originated. Send sketch of rooms, with suggestions as to woods, price, etc., for designs and estimates. Factory, 84 to 96 Erie Street, Toledo, Ohio.
Office and Salesroom, 12 East 14 St., New York.

Elevators and Hoisting Machinery.

STEPHEN A. MORSE. C. M. WILLIAMS. EDWIN F. MORSE.
Morse, Williams & Co.
Manufacturers and Builders of
Hydraulic, Steam, Belt and Hand-Power Passenger and Freight Elevators, Dumb-Waiters, Automatic Hatch-Doors, etc.
Sole owners of the right to apply the Heebner Patent Governor to Elevators and Hoisting Machinery. *Send for Illustrated Circular.*
Nos. 411 and 413 Cherry Street, Philadelphia, Pa.
Branch Office, 108 Liberty St., New York.

Iron Structures.

BOSTON BRIDGE WORKS,
D. H. ANDREWS, Engineer.
Office, ... 13 Pemberton Square Boston.
WROUGHT IRON TRUSSES,
BOX AND PLATE GIRDERS & BEAMS
For sustaining roofs, floors, walls, and other loads of all kinds, designed and built. Our long experience embraces the designing and construction of many wrought-iron structures, large and small, a conspicuous example of which may be examined in the wrought-iron trusses for roofs and floors of the Exhibition Building of the N. E. Manufacturers' and Mechanics' Institute, Boston.

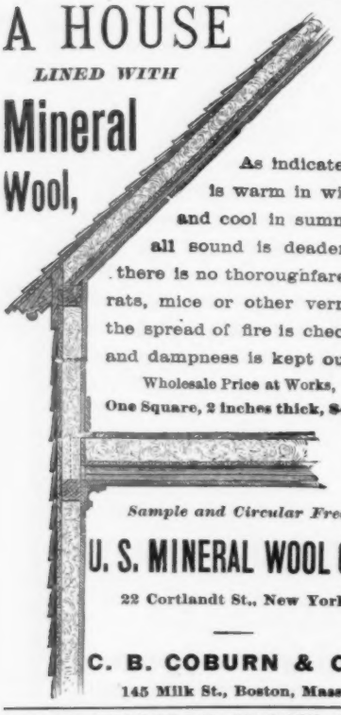
Portland and Keene's CEMENTS.

J. B. WHITE & BROS., (Limited.)
Manf's of English Portland and Keene's
Superfine and Coarse Cements.
We beg to announce that we have changed our Importer and have appointed MARCIAL & CO., 36 Broadway, N. Y. our sole agents for the Atlantic Seaboard of the U. S., and we ask all buyers of our Cements to address all inquiries to them.
LONDON, February 1st, 1885.
WHITE'S PORTLAND.
Quality and packages the best. Works the largest in the world. Price the lowest for the quality.

Peerless Colors for Mortar.

PEERLESS COLORS FOR MORTAR,
BLACK, BROWN, BUFF, RED.
Brightest and Most Durable Colors Manufactured.
SEND FOR CIRCULAR.
SAMUEL H. FRENCH & CO.,
York Avenue and Callowhill Street, Philadelphia, Pa.

A HOUSE
LINED WITH
Mineral Wool,



As indicated, is warm in winter and cool in summer; all sound is deadened; there is no thoroughfare for rats, mice or other vermin; the spread of fire is checked and dampness is kept out.
Wholesale Price at Works,
One Square, 2 inches thick, $4.00.
Sample and Circular Free.
U. S. MINERAL WOOL CO.,
22 Cortlandt St., New York.
C. B. COBURN & CO.,
145 Milk St., Boston, Mass.

SETH THOMAS CLOCK CO.,
THOMASTON, CONN.
20 MURRAY ST., NEW YORK,
TOWER CLOCKS.
SEND FOR CATALOGUE.

McSHANE BELL FOUNDRY

Manufacture those celebrated Bells and Chimes for Churches, Tower Clocks, &c., &c. Prices and Catalogues sent free.
Address
H. McSHANE and CO.,
Baltimore, - - - Md.

Steam Heating.

Page Steam Heater.
The Cheapest, Most Economical and Efficient Heater in the Market.
SPECIFICATIONS AND ESTIMATES FURNISHED.
Send for Circulars.
PAGE STEAM HEATING COMPANY,
NORWICH, CONN.

BALL BEARING DOOR HANGERS
For House Doors, Car Doors, Elevator Doors.
Frictionless. Indestructible. Perfect. Send for Circular.
COHOES IRON FOUNDRY AND MACHINE CO., COHOES, N. Y.

BURDITT & WILLIAMS,
20 Dock Square,
BOSTON.
Unequalled Stock of Choice Hardware.
Specifications figured and orders filled in all markets.

NATURAL WOOD FINISHING.
Good taste and artistic appreciation demand the preservation of Nature's colors in finishing the interior wood-work of your house, therefore, use only
BERRY BROTHERS'
HARD OIL FINISH,
which preserves, heightens, and brings out the natural color of all woods. For the interior wood-work of *public buildings* and *private houses* this article has never been equalled, always maintaining its standard character amid the many so-called imitations its success has brought upon the market. See that every package bears our brand or label. Samples finished wood furnished on application.
BERRY BROTHERS, Varnish Manufactur's, Detroit.
For outside doors use Berry Brothers' "ELASTIC OUTSIDE FINISH."

Elevators.

Z. WILE,
PASSENGER AND FREIGHT ELEVATORS,
Hand-Hoists, etc., of the latest improved inventions now manufactured. Invalid Elevators a specialty.
Office, 191 Tremont Street, Boston.

H. B. MARTIN,
51 & 53 W. Lake St., Chicago, Ill.
Manufacturer of
Patent Automatic
Parlor Passenger Elevators.
Complete without engine, steam or water. None too feeble to operate them.
Also, Paradox Hand-Elevators,*
Paradox Dumb-Waiters,
AND
* The Paradox Lever-Movement for Elevators and Dumb-Waiters for the Trade. Send for Circulars.

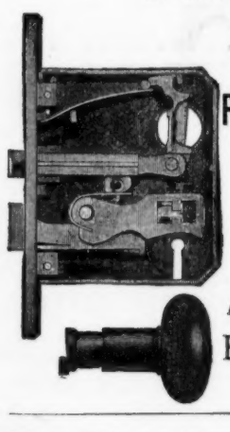
E. BREWER,
Hydraulic, Steam, Belt, and Hand
ELEVATORS, For Freight and Passengers.
267 Federal St., Boston. 149 Broadway, New York.
Send for Circular.

HYDRAULIC STEAM AND BELT ELEVATORS.
Hand-Hoists operated with ropes or cranks. Automatic Hatch-doors. Governors, and Safety-catches.
GEO. C. HOWARD.
Works, 1763 Barker Street, Philadelphia, Pa
New York Office, 12 Cortlandt Street.

CREOSOTE STAINS.
Patented Dec. 29th 1884.
for Shingles, Clapboards & other exterior woodwork.
Sam'l Cabot Jr.
Sole Manufacturer
70 Kilby St. Boston.
Descriptive Circular by mail on application.

H. A. STREETER'S
Patent Solid Muntin
Metallic Window-Sash
For Fire-proof Buildings, Insane Asylums, Prisons, etc., etc.
Light, strong and durable. Fire and burglar proof. Best, cheapest and neatest form of fire-proof sash now in use. Used in the State Insane Asylum, Kankakee, Ill., Major Willett, Architect, Chicago; Insane Asylum, St. Joseph, Mo., Col. S. V. Shipman, Architect, Chicago; Cook Co. Insane Asylum, Jefferson, Ill., Egan & Hill, Architects, Chicago.
Manufactured by GLOBE IRON WORKS,
H A. STREETER, Proprietor,
35 to 41 Indiana Street, Chicago, Ill.

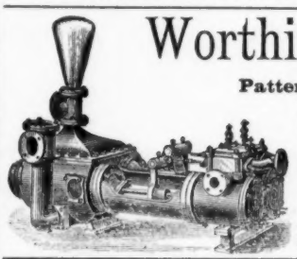
Nichols, Bellamy & Co.,
657 Washington St., Boston, Mass.
AGENTS FOR
NILES' PATENT LOCKS and KNOBS.



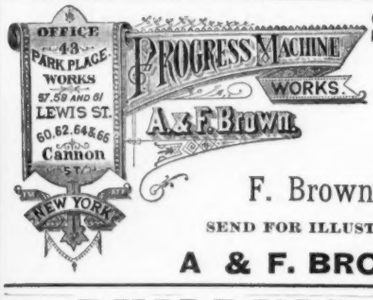
A Full Assortment of
Builders' Hardware.

The Temporary Binder
Provided by us will keep your copies of the *American Architect* in PERFECTLY uninjured condition.
Price $1.25, post paid.

WIRE LATHING,
ESPECIALLY ADAPTED TO
Public Buildings, Private Residences, Mills, Warehouses, Stores, and all Mercantile Structures.
IT IS POSITIVELY FIRE-PROOF.
WIRE LATHING possesses the following qualities:
IT IS NOT COSTLY.
IT IS EASILY AND CHEAPLY APPLIED.
PLASTERING ON THE WIRE LATH WILL NOT CRACK.
THE LATH WILL NOT CORRODE.
The plastering, when applied, **clinches** on both sides of the wire, **forming a double surface.**
THE WIRE LATHING is extensively used by the United States Government in its Custom House, Court House, and Post Office Buildings.
It is indorsed by the leading Insurance Companies, who have applied it to their own fine edifices.
Full information given on application to the
CLINTON WIRE CLOTH CO., Clinton, Mass.
59 Beekman Street, New York. 137 Lake Street, Chicago.



Worthington Steam Pumps.
Patterns specially adapted to
HOUSE TANK SERVICE
And Hydraulic Elevators.
ABSOLUTELY NOISELESS.
HENRY R. WORTHINGTON - New York.
BOSTON, CHICAGO, ST. LOUIS, CINCINNATI, CLEVELAND, SAN FRANCISCO, PITTSBURGH.



SHAFTING, PULLEYS, HANGERS.
F. Brown's Patent Friction-Clutch.
SEND FOR ILLUSTRATED CATALOGUE AND DISCOUNTS TO
A & F. BROWN, 43 Park Place. N. Y.

BUILDING MATERIALS.
Reported for the American Architect and Building News.

BRICK.—₱ M.	New York. (Wholesale Prices.)	Boston. (Prices to Builders and Contractors.)	Chicago.	Philadelphia
Common: *Cargo afloat.*				
Pale	$3 00 @ $3 50	Eastern	Building Brick	Hard
Jersey	4 50 @ 5 50	7 00 @ 7 50	6 00 @ 7 00	@ 8 00
Long Island	@	Bay State Hard		Salmon
Up River	4 75 @ 5 50	9 00		@ 6 00
Haverstraw Bay	5 50 @ 5 75	Domestic Com.	Indiana Pressd	Stretchers
" 1st	5 75 @ 6 25	8 00 @ 9 00	16 00 @ 28 00	@ 11 00
Hollow	@ 13 00	Domestic Face	St. Louis Fronts	Pressed
Fronts:		19 00 @ 20 00	@ 27 00	20 00 @ 23 00
Croton, Brown	12 00 @ 13 00	Philadelphia		End Headers, all colors
" dark	12 00 @ 14 00	40 00 @ 45 00		@ 65 00
" red	12 00 @ 14 00	Phila. mould		Edge & End all colors
Chicago pressed		50 00 @ 80 00	22 00 @ 29 00	@ 85 00
Chicago Moulded			65 00 @ 350 00	
Baltimore	37 00 @ 41 00		@ 50 00	
Glens Falls—white	30 00 @ 35 00	Glens Falls		
Philadelphia	24 00 @ 25 00	25 00 @ 26 00	@ 45 00	
Trenton	24 00 @ 25 00		38 00 @	
Milwaukee		Glens Falls	25 00 @	
Moulded:		Mould.	60 00 @ 100 00	
Clark's Glens Falls—Red	25 00 @ 27 00	30 00 @ 35 00	30 @	
" —White	30 00 @ 35 00	35 00 @ 40 00	35 @	
White " Mold,	45 00 @ 60 60	45 00 @ 60 00	55 00 @ 65 00	
Enamelled: *Imp.*				
Enamelled (edge.)	85 00 @ 100 00	@	@ 100 00	Dom. @ 65
Enamelled (edge and end)	90 00 @ 115 00	@	@ 120 00	@ 85
CEMENT, LIME, etc.—(₱ *cask.*)				
Rosendale Cement	95 @ 1 00	@ 1 40	*Not Sold.*	1 50 @ 1 75
Utica, Akron, Buffalo, Louisville, Milwaukee	*Not sold.*	*Not sold.*	1 00 @ 1 25	*Not sold.*
Portland, English (Gibbs)	2 50 @ 3 10	@ 3 20	3 00 @ 3 25	@ 3 50
" " (K. B. & S.)	2 75 @ 3 10		3 25 @ 3 50	@ 3 25
" " (Burham)	2 50 @ 2 80		3 15 @ 3 35	@ 3 00
" " (White's)	2 85 @ 3 00			
" German (Alsen)	2 50 @ 3 00	3 00 @ 3 50	3 15 @ 3 35	@ 25
" " (Fewer)	2 45 @ 2 70	3 15 @ 3 35	3 15 @ 3 35	
" " (Vorwohler)	2 50 @ 3 25		3 00 @ 3 25	
" " (Dyckerhoff)	2 75 @ 3 15	3 00 @ 3 50	3 25 @ 3 50	3 00 @ 3 2
" " (Lagerdofer)	@ 2 70	*Not sold.*	*Not sold.*	*Not sold.*
" " (Hanover)	2 50 @ 3 00		3 15 @ 3 35	2 50 @ 3 00
" French (Lafarge)	3 50 @ 4 50	*Not sold.*	3 75 @ 4 25	4 50 @
" American (Saylor's)	2 15 @ 2 30	2 15 @ 2 50	2 75 @ 3 00	2 50 @ 3 00
Selenitic		1 65	*Not sold.*	
Roman	2 75 @ 3 00	@ 3 20	2 75 @ 3 25	3 50 @ 3 75
Keene's coarse	5 00 @ 6 50	@ 7 50	8 00 @ 9 00	6 50 @ 7 00
" superfine	8 75 @ 11 00	@ 11 50	12 00 @ 13 00	11 50 @ 12 00
Lime:				
Lime of Teil	@ 5 00		*Not sold.*	
Hydraulic Lime	@ 1 45	@ 145		
Chicago Lime in bulk			65 @ 75	White Mash
Wisconsin "			75 @ 85	1 25 @ 150
Rockland and Rockport, (Com.)	@ 1 00	@ 1 15	*Not sold.*	1 00 @ 1 00
Rockland and Rockport, finish	@ 1 20	@ 1 20	*Not sold.*	
State, com. cargo rates (nom.)	@ 90	*Not sold.*	*Not sold.*	*Not sold.*
State, finishing "	@ 1 10	*Not sold.*	*Not sold.*	*Not sold.*
Plaster of Paris (calcined.)	@ 1 25	1 65 @ 1 90	@ 1 75	2 00 @ 2 25
" (casting)	@ 1 35	@ 2 25	@ 1 75	2 25 @ 2 50
Hair (Cattle) ₱ *bush*	21 @ 25	@ 30	20 @ 25	20 @ 25
" (Goat)	30 @ 35	@ 30	35 @ 40	28 @ 33
Sand, ₱ *load*	1 00 @ 1 25	@ 1 50	100 @ 1 25	@ 1 50
STONE. (₱ *cubic foot, rough.*)				
Granite: (*Maine*)		@ 60		75 @ 2 00
Limestone:				
Bedford	@ 1 00	95 @ 1 00	50 @	3 75 @
Joliet	@		35 @ 55	
Lemont	@		35 @ 60	
Serpentine			80 @ 90	75 @ 1 25

(Continued on page vi)

MASSACHUSETTS

INSTITUTE OF TECHNOLOGY.

BOSTON, MASS.

This school offers a four year's scientific and professional training in Civil, Mechanical, Mining and Electrical Engineering, Chemistry, Natural History, etc.

THE COURSE IN ARCHITECTURE

embraces, besides the necessary scientific and mathematical subjects, the study of architectural history, and the constant practice of original design.

Students in Architecture are received into a two year's special course.

FRANCIS A. WALKER, Prest. J. P. MUNROE, Sec'y

Harvard University,

CAMBRIDGE, MASS.

Lawrence Scientific School.

Four years' courses are given in: I, Civil Engineering; II, Chemistry; III, Natural History (Biology or Geology); IV, Mathematics and Physics. The degrees given are Civil Engineering and Bachelor of Science. Graduates of Colleges can enter with advanced standing of one or two years.

Persons who are not candidates for a degree may enter the School as Special Students, at any time, without examination, and pursue any of the courses of instruction for which they are found competent. Address the Dean of the Lawrence Scientific School.

Cornell University.

DEPARTMENT OF

Architecture, Civil Engineering, Mechanical Engineering

The course in Architecture embraces the necessary scientific and mathematical studies, the history of the art, and constant practice in drawing and designing.

Persons 21 years of age, properly qualified, are received as special students, without the usual entrance examinations. For copies of the Register, giving full information, address the

TREASURER OF CORNELL UNIVERSITY, ITHACA, N. Y.

SCHOOL OF MINES,
Columbia College.

Department of Architecture.

For information, address

GEO. F. FISHER, Registrar,
Or Prof. W. R. WARE, School of Mines,
49th Street and Madison Avenue, New York.

F. W. DEVOE & CO.,

(Established 1852.)

Fulton Street corner William, NEW YORK,

MANUFACTURERS OF

White Lead Colors in Oil and in Japan.

Pure Ready-Mixed Paints.

Sample Cards of 50 desirable shades on request.

FINE VARNISHES.

Hard Oil-Finish, Wood-Stains and Finishes, Florentine Fresco Colors, Mathematical Instruments.

Engineers' Supplies, Levels, Chains, Cross-Section Papers, Blue-Process Papers, etc.

Illustrated Catalogue of Engineers' Supplies.
250 Pages, 700 Illustrations.
Sent on request.

COFFIN, DEVOE & CO.,

176 RANDOLPH STREET, CHICAGO.

Established 1827.
W. JACKSON, & SON,
Manufacturers and Importers of
Grates, Open Fireplaces,
Fenders, Fire Irons, etc.
1166 Broadway, Bet. 27th & 28th Sts.
246 Front Street, Near Peck Slip,
New York.

J. REYNOLDS & SON,

FURNACE MANUFACTURERS.

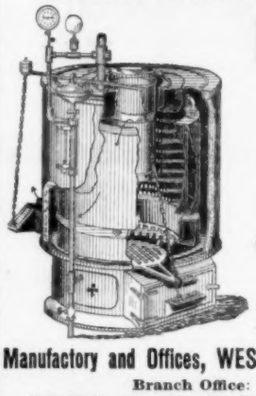
Kitcheners, Grates, etc.

Send for Catalogue.

13th and Filbert Streets., Philadelphia, Pa.

HOUSE WARMING.

The Wilson Patent Base-Burning



Portable Boiler.

Improved 1885.

OVER 300 In Use.

Manufactory and Offices, WESTFIELD, N. Y.

Branch Office:
241 Erie Street, Buffalo, N. Y.

BUILDING MATERIALS.

	New York.	Boston.	Chicago.	Philadelphia
Foundation:	*(Wholesale Prices.)*	*(Prices to Builders and Contractors.)*		
Dimension	@	5 00 ℔ ton	20 @ 28	30 @ 5 00
Block	@	4 60 ℔ perch	8 50 ℔ cord.	50 @ 6 00
Rubble	@	1 25 @ 1 50	8 50 @	
Bluestone: (℔ *sq. ft.*)				
Sidewalk	30 @ 5 00	40 @ 1 75	75 @ 1 00	70 @ 90
Planed	50 @ 6 00	75	50 @ 1 00	1 10 @ 1 25
Sandstone,				
Longmeadow		75 @ 85		
Kibbe		85 @ 95		
Brown (Connecticut)	1 00 @	1 25 @ 1 45	1 50 ℔ cub.ft.	1 35 @ 2 00
Amherst } Ohio	90 @ 95	90 @ 1 00	55 @ 65	
Berea } Ohio	75 @ 1 00	80 @ 90	45 @ 55	80 @ 1 10
Berlin } Ohio	75 @ 1 00	80 @ 90	55 @ 65	
Belleville	80 @ 1 25	1 25 @ 1 35	"	
New Brunswick and Nova Scotia	@ 1 00	75 @ 1 00	"	
Caen	@	@ 2 00	"	
Marble (℔ *cu. ft.*)				
Lee, Mass	@	1 75 @ 2 50	*Not sold.*	2 00 @ 2 50
Rutland, white	@	@ 3 00	3 50 @ 6 00	2 25 @ 2 50
Sutherland Falls	1 25 @ 1 75	@ 2 00	3 50 @ 6 00	2 50 @ 4 00
Glens Falls, black	@	2 00 @ 3 00	*Not sold.*	4 00 @ 4 50
Italian, blue-veined	@	50 @ 60	@ 4 40	—@—
" Sienna	@	3 00 @ 3 50	*Not sold.*	3 25 @ 6 50
Tennessee, red	@	1 25 @ 2 50	@ 4 00	2 00 @ 3 00
" Knoxville	@	85 @ 90	@ 4 00	@ 1 50
Pennsylvania, blue	@		*Not sold.*	2 23 @ 2 50
Vermont, white	@	1 50 @ 2 00	3 50 @ 6 00	
Slate: Roofing (℔ *square*)	7 00 @ 8 00	4 50 @ 7 00	6 25 @ 8 10	6 25 @ 7 00
" green	@ 5 75	@ 5 75		
" " unfading	7 00 @ 8 50	5 50 @ 6 50	@ 8 60	@ 7 00
" purple	@ 15 00	13 00 @ 14 00	— @ 16 00	@ 12 00
" red	—@—	Brownville, Me.	7 20 @ 7 60	@ 4 00
" black, Lehigh	—@—	6 50 @ 9 00	7 30 @ 8 00	@ 4 50
" " Chapmans	@	5 50 @ 8 00	6 00 @ 8 50	5 50 @ 8 00
" Unfading Black, Monson, Me.	@		*Not sold.*	@ 15 00
Tiles, Am. ℔ M.				@ 3 85
N. Peach Bottom, warranted unfading				
LUMBER.—℔ M.				
Boards: (*Ordinary dimensions.*)				
Pine, 1st quality, clear	65 00 @ 75 00	50 00 @ 60 00	44 00 @ 46 00	65 00 @ 75 00
" 2d quality	55 00 @ 60 00	42 00 @ 48 00	40 00 @ 44 00	55 00 @ 60 50
" 3d quality	18 00 @ 22 00	35 00 @ 40 00	37 00 @ 42 00	18 00 @ 22 00
Spruce	@ 25 00	11 00 @ 14 00	*Not sold.*	@ 22 50
Hemlock	ea. 17 @ 18	11 00 @ 12 50	@ 10 00	12 50 @ 15 00
Yellow pine	20 @ 40	30 00 @ 38 00	@ 28 00	17 00 @ 20 00
Cypress	@	32 00 @ 40 00	@	40 00 @ 55 00
Clapboards:				
Pine	@	33 00 @ 55 00	9 00 @ 20 50	—@—
Spruce	@	23 00 @ 35 00	*Not sold.*	—@—
Framing Timber:				
Pine			11 00 @ 16 00	25 00 @ 35 00
Spruce	13 50 @ 16 00	13 50 @ 15 00	*Not sold.*	18 50 @ 20 00
Hemlock	12 00 @ 15 00	@	10 50 @ 15 50	12 00 @ 13 00
Yellow pine	18 00 @ 25 00	23 00 @ 26 00		25 00 @ 30 00
Laths:				
Pine	@	2 25 @ 2 35	1 75 @	—@—
Spruce	2 20 @ 2 25	2 00 @ 2 25	*Not sold.*	2 35 @ 2 40
Shingles:				
Pine, shaved ℔ M.	5 00 @ 6 00	@	*Not sold.*	
Pine, sawed "	4 00 @ 5 00	@ 4 50	2 25 @ 2 45	
Spruce, sawed "	1 50 @ 2 00	@ 1 50	*Not sold.*	
Redwood ℔ 125	1 40 @ 1 60	3 75 @ 4 50	5 50 @ 8 00	30" $10 @ 28
Cedar, split ℔ M.	@		*Not sold.*	24" 8 @ 21
Cedar, sawed "	@	2 00 @ 4 00	2 00 @ 2 25	20" 5 50 @ 14
Cypress. Split....7 x 24. "	18 00 @ 20 00	5 50 @ 6 00	4 00 @ 4 50	13 00 @ 20 00
Miscellaneous:				
Piles ℔ ft.	4½ @ 5½	Piles 6c. ℔ ft.	*Not sold.*	
Fence pickets, Spruce	8 00 @ 10 00	10 00 @ 18 00	Pine, 8 @ 1	12 00 @ 14 00
Cedar posts, 9 ft. (sq. posts.)	@	25 @ 35	9 00 @ 21 00	70 @ 1 25
Chestnut "	@	25 @ 35	*Not sold.*	28 @ 36
Finishing Woods: ℔ M. (*First Quat. Kiln-dried.*)				
Ash	@ 55 00	38 00 @ 48 00	35 00 @ 40 00	45 00 @ 50 00
Cherry	80 00 @ 120 00	60 00 @ 90 00	80 00 @ 100 00	65 00 @ 90 00
Chestnut	@ 55 00	38 00 @ 50 00	45 00 @ 50 00	60 00 @ 80 00
Butternut	40 00 @ 60 00	60 00 @ 70 00	50 00 @ 60 00	70 00 @ 85 00
Mahogany, Baywood [Mexican]	@ 180 00	150 00 @ 160 00	150 00 @ 180 00	120 00 @ 150
" St. Domingo	@ 350 00	120 00 @ 350 00	250 00 @ 300 00	
Maple	45 00 @ 50 00	45 00 @ 65 00	30 00 @ 35 00	30 00 @ 50 00
Oak, red	@ 70 00	@ 50 00	35 00 @ 40 00	35 00 @ 45 00
" white	@ 70 00	@ 55 00	35 00 @ 40 00	55 00 @ 65 00
" quartered	@ 90 00	65 00 @ 70 00	45 00 @ 50 00	70 00 @ 80 00
Sycamore quartered		50 00 @ 65 00	40 00 @ 50 00	70
Pine, clear	65 00 @ 70 00	30 00 @ 65 00	45 00 @ 50 00	65 00 @ 90 00
Redwood	60 00 @ 70 00	60 00 @ 70 00	56 00 @ 65 00	100 00 @
Rosewood ℔ lb	@ 6		@ 7	
Walnut, black	125 00 @ 150 00	85 00 @ 120 00	80 00 @ 100 00	160 00 @ 200 00
Whitewood	45 00 @ 50 00	38 00 @ 45 00	30 00 @ 35 00	20 00 @ 30 00
Yellow pine ℔ M	@ 45 00	40 00 @ 45 00	30 00 @ 35 00	30 00 @ 35 60
Gumwood, best red			30 00 @ 35 00	
PAINTS. (*In oil,* ℔ *lb.*)				
White lead, Am.	6½ @ 6¾	@ 6½	@ 6¼	5 @ 6½
" Zinc, "	5 @ 8½	@ 8	7 @ 10	4 @ 6
Red lead, Am.,	6 @ @ 6½	@ @ 6½	@ @ 6½	
" Venetian	6 @ @ 10½	7 @ @ 12	1¾ @ @ 2¼	6 @ @ 8
" Vermilion	65 @ @ 70	55 @ @ 60 dry	55 @ @ 60	Am. 14 @ @ 22
Red Indian, Eng.	12 @ @ 20	12 @ @ 20	12 @ @ 20	12 @ @ 18
Yellow Ochre	6 @ @ 15	7 @ @ 12	3 @ @ 15	7 @ @ 9
" Chrome	12 @ @ 20	18 @ @ 25	12 @ @ 25	12 @ @ 25
Green (chrome)	8 @ @ 13	8 @ @ 20	8 @ @ 20	9 @ @ 15
Green, Paris,	25 @ @ 40	25 @ @ 40	16 @ @ 35	18 @ @ 22
Black, lamp,	15 @ @ 25	15 @ @ 25	8 @ @ 30	8 @ @ 12
Blue, ultramarine	12 @ @ 18	18 @ @ 30	10 @ @ 35	11 @ @ 35
Oil, linseed, (raw) (℔ *gal.*)	45 @ @ 48	48 @ @ 53	46 @ @ 48	52 @ @ 55
" " boiled (℔ *gal.*)	48 @ @ 51	51 @ @ 56	49 @ @ 51	57 @ @ 59
Turpentine (℔ *gal.*)	35 @ @ 37	41 @ @ 48	41 @ @ 43	@ @ 45
Varnish, coach (℔ *gal.*)	@ @	1 50 @ @ 6 00	1 25 @ @ 2 00	1 75 @ @ 5 25
Shellac (℔ *gal.*)	@ @	2 50 @ @ 3 00	3 25 @ @ 4 00	1 10 @ @ 1 75
Putty	2 @ @ 3	2 @ @ 4	02 @ @ 03	2 @ @ 2½
Whiting } dry	50 @ @ 65	1 @ @ 1½	1 @ @ 2	1 @ @ 1½
Paris white, (Eng.,) } dry	2 @ @ 3	2 @ @ 3	2 @ @ 2¾	1½ @ @ 1¾
Litharge, Am.	5½ @ @ 5¾	6½ @ @ 7	6½ @ @ 10	6¾ @ @ 7½
Sienna (burnt)	12 @ @ 17½	14 @ @ 20	4 @ @ 16	9 @ @ 14
Umber, "	11 @ @ 16½	14 @ @ 20	@ @ 10	9 @ @ 14

The GOODWIN GAS STOVE & METER CO.,
MANUFACTURERS OF
The Sun Dial Gas Cooking and Heating Stoves.

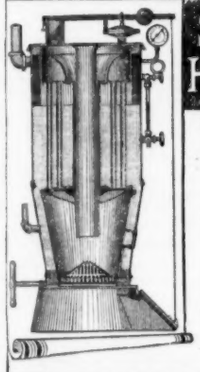
The most economical in use. Over 50 different kinds. Suitable for Families, Hotels, Restaurants and Public Institutions. Laundry, Hatters' and Tailors' Heaters. Hot-Plates, Warming-Closets for Pantries. Hot-Water Generators, etc., etc.

1012-1016 Filbert Street, Philadelphia.

142 Chambers Street, New York.
126 Dearborn Street, Chicago.
Waldo Bros., Agts., 88 Water St., Boston, Mass.

LEBOSQUET BROS.
Steam Heating APPARATUS
Combining the Latest Improvements.
HEATING PRIVATE RESIDENCES A SPECIALTY.
Send for Descriptive Pamphlet.
LEBOSQUET BROS., 75 Union St., Boston.

Unparalleled Success
THE NEW
American Automatic
STEAM HEATER

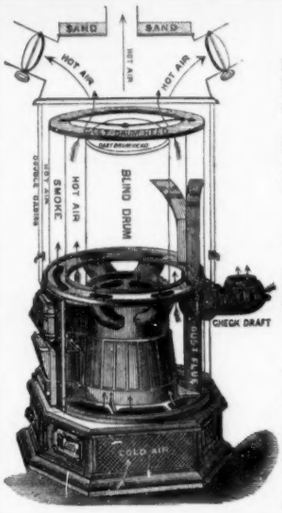


FOR DWELLINGS, PUBLIC BUILDINGS, RAILWAY STATIONS, OFFICES, ETC.
LOW PRESSURE, SELF REGULATING, ECONOMICAL, CHEAP, DURABLE.
UNIFORM HEAT, NO GAS, DUST OR SMOKE. NO OBJECTIONS.

MANUFACTURED BY
NEWELL UNIVERSAL MILL CO
10 BARCLAY ST. NEW YORK
SEND FOR ILLUSTRATED CATALOGUE.

FISCHER-LEAF CO.

—MANUFACTURERS OF—
Marbleized-Iron and Slate Mantels, Grates, Stoves and Hollow-Ware, and dealers in
AMERICAN, ENGLISH and FRENCH TILE.
Send for Catalogue, and Prices
351 to 357 Jefferson St., Louisville, KENTUCKY.



A Brief Description of the
Novelty Hot-Air Furnace
has run for several issues that all might be acquainted with its character and qualities, which enables a comparison, when its superiority becomes apparent. We call attention to a few of its special features and give some informative experience.

Immense Heated Surface Exposed, The Economical Consumption of Fuel, Its Prolonged Durability under Severe Test, Perfectly Self-Cleaning, avoiding Annual Expense, Entirely Free from Gas and Dust, Superior Operation, Convenient, Easily Managed.

THE PREVAILING OPINIONS.

MARTINSBURG, W. VA., October 14, 1884.
MR. J. H. BLONDEL.
Dear Sir, — The two Furnaces which your father put in the St. Joseph's Catholic Church *nine years* ago, under a guaranty to do the work, have given every satisfaction, and have *never yet needed repairs*. I with pleasure recommend the Novelty Furnace, and would be glad to see them in all of our churches.
H. J. MCKEEFRY, Pastor.

HAMPTON, VA., April 14, 1885.
ABRAM COX STOVE CO.
Gentlemen, — The No. 40 Novelty I placed in our Baptist Church 18 months ago has given entire satisfaction. The church is 50′ x 52′, ceiling 24′, and all parts were comfortable during the zero weather of this winter. It is perfectly free from gas and dust, an important feature for church use, while the check draft is convenient and effectual. Take the Heater all in all, I am very much pleased with it, as it is first-class in all essentials. Yours very truly,
G. M. RICHTER.

ABRAM COX STOVE CO., 144 No. Second Street, Philadelphia, Pa.

JOHN DAVIS & CO., Contractors for
STEAM HEATING & VENTILATING
For Stores, Hospitals, Factories and all Public Buildings. Estimates and specifications furnished for direct and indirect heat. Boilers of superior quality and design; also Steam Pumps, Iron Pipe and Fittings. Call or address
71 to 75 Michigan Street, CHICAGO.

Foundry, Westfield, Mass.

THE H. B. SMITH CO.,
MANUFACTURERS OF
The Union Steam and Water HEATING APPARATUS,
For Public Buildings and Private Residences.
Also Manufacturers of
Reed's Improved Cast-Iron Radiators,
Mill's Safety Sectional Boilers,
Gold's Indirect Pin Radiators, etc.
Office and Warerooms, 137 Centre St., New York.

STEAM WARMING.
BATES & JOHNSON,
114 LEONARD STREET, - - - - - - NEW YORK.
59 West Water Street, Syracuse. 310 Broadway, Albany.
House Warming a Specialty. Estimates Furnished on Application.

PIPE-COVERING.
This covering is made entirely of Asbestos, and can n be affected injuriously by heat or dampness, nor can it be made a harbor for vermin.
Asbestos Building-Felt, Fire-Proof Cements, &c.
THE CHALMERS-SPENCE CO.,
419-421 E. 8th Street - - NEW YORK.

STEAM-FITTING DIVISION
—OF THE—
NEW YORK STEAM COMPANY,
66-68 CORTLANDT STREET, NEW YORK.
Contractors for Steam-fitting of every description. Work executed from the designs of Architects and Engineers. Plans and Specifications furnished. Correspondence solicited.
General Offices, 22 CORTLANDT ST., N. Y.
Superintendent, H. M. SMITH, *Heating and Ventilating Engineer.*

GORTON'S HOUSE HEATING STEAM-GENERATOR.
Self-Feeding, Base-Burning, Wrought-Iron. First-class in its construction, perfectly safe in use, generates steam quickly and rapidly; is compact, taking small floor-space, requiring no brick-work in setting; economical in the use of fuel, and costing much less than any other wrought-iron boiler of like capacity now in use. Write to us for Catalogue and Price-List. See cut in Monthly Nos.
GORTON BOILER MANUFACTURING CO., 110 Centre St., New York.

W. H. HARRISON & BRO.,
Manufacturers,
PLAIN AND ARTISTIC
GRATES
AND FIREPLACES
A SPECIALTY.
Also, **Furnaces and Ranges.**
Send for Illustrated Catalogue. 1435 Chestnut St., Philadelphia.

THE FLORIDA
House - Heating Boiler.
(Catchpole's Improved.)
The cheapest and most economical Low-pressure Steam Boiler in use. Illustrated Catalogue free.
The FLORIDA BOILER WORKS, Geneva, N. Y.

GLOBE VENTILATORS & CHIMNEY CAPS.

Public and Private Buildings and Railroad Cars Perfectly Ventilated.

SMOKY CHIMNEYS CURED!

STATIONARY, ORNAMENTAL, NOISELESS, STORM-PROOF, DURABLE, SIMPLE, and CHEAP.

Send for Price-List. Working Model sent on receipt of 20 cents, to pay postage. Manufactured and for sale by

GLOBE VENTILATOR CO.

Office: 203 River Street, Troy, N. Y.

Wholesale Agents for Albany and vicinity, Hoy & Co., Nos. 25 and 27 Green St., Albany, N.Y.
Wholesale Agents for New York City and vicinity, George H. Mosman, 26 Cliff St., New York City.
Wholesale Agents for Philadelphia, Pa., and vicinity, Merchant & Co., 525 Arch St., Phila.
Wholesale Agents for Nebraska, Idaho, Montana, and Wyoming, Milton Rogers & Son, Omaha, Neb.
Wholesale Agents for Milwaukee & Vicinity, Rundle, Spence & Co., 89 West Water St., Milwaukee, Wis.
Wholesale Agents for Boston, Mass., and vicinity, Chas. M. Bromwich, 613 Broadway, South Boston.
Wholesale Agents for Chicago, Ill., Sargent, Greenleaf & Brooks, 45 and 47 Franklin St.
Wholesale Agents for Louisville, Ky., George L. Smith, 167 First St., Louisville, Ky.
Wholesale Agents for Canada, Hughes & Stephenson, 745 Craig St., Montreal, Can.
Wholesale Agents for St. Louis and vicinity, N. O. Nelson & Co., Eighth and St. Charles Sts.
Wholesale Agents for Ogden, Utah, and vicinity, D. D. Jones, Main St., Ogden, Utah.
Wholesale Agents for Rochester and vicinity, E. H. Cook & Co., (Limited) 31 Mill St., Rochester, N. Y.
Wholesale Agents for Minnesota, Wilson & Rogers, 24 East Third St., St. Paul, Minn. Wholesale Agents for Cincinnati and vicinity, H. McCollum & Co., 262 Race St., Cincinnati, O.
Wholesale Agents for Baltimore, Md., Lyon, Conklin & Co., 27 and 29 Light Street, Baltimore, Md.
Wholesale Agents for Detroit, Mich., and vicinity, Dry-Dock Sheet-Metal Works, cor. Orleans and Franklin Sts., Detroit, Mich.

Clover-Leaf Ventilators

AND CHIMNEY CAPS,

For Public & Private Buildings, etc.

Specially adapted for Sanitary Plumbing.

SURE CURE FOR SMOKY CHIMNEYS.

Cheapest and most effective Ventilator on the market. Working models mailed on receipt of 20 cents. Absolutely storm-proof. A down current creates an up draft.

MANUFACTURED AND FOR SALE BY

E. VAN NOORDEN & CO.,

389 Harrison Ave., Boston, Mass.

AGENCIES:

Stambach & Love, Philadelphia; Peck Bros. & Co., New York; Reuter & Mallory, Baltimore, Md.; Pierce, Butler & Pierce, Syracuse, N. Y.; A. Mollo, New Orleans, La.; M. M. Murphy & Co., Cleveland, Ohio; Jas. B. Scott & Co., Pittsburgh, Pa., Detroit Lead Pipe and Sheet-Lead Works, Detroit, Mich.

SHIELDS & BROWN,

78 & 80 Lake Street, - Chicago, Ill.

MANUFACTURERS AND SOLE PROPRIETORS OF

BRADLEY'S

FOR BOILERS AND STEAM PIPES.

Reduces Condensation of Steam.

FOR GAS AND WATER PIPES.

Prevents Sweating and Freezing.

The best Non-Conductor of Heat and Cold in the World.

Send for illustrated descriptive Circular, and name this paper.

NEW YORK OFFICE: 232 Cedar Street.

ST. LOUIS OFFICE: 114 North 7th Street.

ST. LOUIS

Steam Heating and Ventilating Co.,

CONTRACTORS FOR

HEATING BY STEAM

Stores, Residences, Churches, and all Public Buildings. Plans, Specifications and Estimates furnished.

No. 621 OLIVE STREET, ST. LOUIS, MO.

WARM-AIR REGISTERS.

THE TUTTLE & BAILEY M'F'G CO., 83 Beekman St., New York. 64 Union St., Boston.

BIBB'S
Celebrated Original
BALTIMORE FIRE-PLACE HEATERS,
To warm upper and lower rooms. The handsomest, most economical Coal Stoves in the World.
B. C. BIBB & SON,
Foundry, Office and Salesroom, 29 AND 41 LIGHT STREET,
Baltimore, Md.
MARBLEIZED SLATE MANTELS
Send for Circulars.

SLATE MANTELS

Of the latest and most beautiful designs, and all other Slate and Soapstone work on hand or made to order. Joseph S. Miller & Brother, 1210 Ridge Avenue, Philadelphia, Pa. Successor to Wilson & Miller. Send for Illustrated Price-List.

OUR HOMES

HOW TO HEAT & VENTILATE THEM.

An attractive book of 72 pages containing illustrations of some of the finest residences in the country. It is a complete Manual on the subject of Sanitary Heating and Ventilating. Mailed free on receipt of 4 cents in stamps.

SMITH & ANTHONY STOVE CO.
52 & 54 Union St., - - Boston, Mass.

Skylights.

THE HAYES SKYLIGHTS
VENTILATORS ETC.
ESTB 1868 71 8 AVE N.Y.

THE BROOKLYN METALLIC SKYLIGHT WORKS.

JOHN SETON, 78 and 80 Washington Ave., BROOKLYN, N. Y.

Send for new illustrated catalogue and price-list.

METAL SKYLIGHTS.

Warranted absolutely Storm, Weather, Fire and Condensation Proof, Free from Leakage from any source.

Skylights and Glass furnished and put up by us in any part of the country.

Ventilators and Chimney Caps or Smokey Chimneys.

CORRUGATED IRON ROOFING AND SIDING.

GARRY PATENT IRON ROOFING AND IRON SHINGLES.

Galvanized Iron Cornices, Window Caps, Copper Gutters and Conductors.

E. VAN NOORDEN & CO.,
389 HARRISON AVE., - - BOSTON.

BICKELHOUPT'S METALLIC SKYLIGHTS.

NO INFRINGEMENT on any other.

Are the Cheapest and Best.

Manufactured by

BICKELHOUPT BROTHERS,
218 West 37th Street, New York.
Send for Illustrated Catalogue.

Skylights.

Pardessus' Exhaust Ventilating Sky-Lights

DOME EXHAUST VENTILATOR CAP.

Natural Heat only relied upon, no foul Air, no Smoky Chimney with these caps in use. Cheap and most effective.

DOUBLE PASSAGE, QUICK FIRE REACH, AND PRACTICAL FIRE-ESCAPE.

Absolute safety to occupants of lofty buildings, in rescuing Invalids, the feeble and timid, as well as the able, without harm.

No danger from smoke, flame, ice, freezing or exposure.

A Descriptive Illustrated Pamphlet of each of the above sent at request.

S. J. Pardessus, Patentee

10 and 12 COLLEGE PLACE,
Bet. Barclay & Park Place,
NEW YORK.

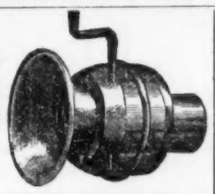
Furniture and Interior Work.

Ostrander's New Oral Annunciator.

Superior in every respect. No Batteries or Wires.

Hotels, Apartment-Houses, Residences, Offices, Factories, etc. fitted in any part of the Country. Complete Outfits of Speaking-Tubes, Whistles, Pneumatic-Bells, etc., furnished. Send for New Catalogue. Estimates furnished.

W. R. OSTRANDER & CO.,
21 and 23 Ann St., New York.



NATURAL WOOD ORNAMENTS,

— FOR —

ARCHITECTS, HOUSE BUILDERS,
INTERIOR DECORATORS,
WOOD MANTLE MANUF'RS,
STAIR BUILDERS, ETC.

THE TAFT COMPANY,

20 CUSHMAN STREET, - - - HARTFORD, CONN.

W. C. RUNYON & CO.,

Cor. Hebard St., and N. Y. Central & Hudson River R. R.
ROCHESTER, N. Y.

Manufacturers of

Patent Lead Joined
END-UP
WOOD-MOSAIC.

Special designs for floors and wainscoting furnished on application

Send for Catalogue.

Moorish Fret-Work,

— OR —

INTERLACED WOOD-WORK.

Unequalled for Interior Decorations, Spiral Mouldings, and Balusters.

C. S. RANSOM & CO.,
Cleveland, Ohio.

IMPROVED SEATING,

For Schools, Churches, *Halls &* OPERA HOUSES.

Send for Catalogue showing 20 Best Styles manufactured by

A. H. Andrews & Co.,
Successors to
BAKER, PRATT & CO.

815 Arch St., Phila. | 195 Wabash Av., Chicago. | 19 Bond St., N. Y.

ELECTRIC LIGHT WIRING.

CONTRACTORS.

Charles J. Klein & Co., 39-41 Ann St., N. Y., Incandescent Electric Lamps for use with battery. *Call-Bells, Burglar-Alarms,* Batteries and all *Electrical Supplies.*

Correspondence solicited.

METALLIC FRAME

WIRE WINDOW-SCREENS

Send for circular and references.

Over 15,000 in Use.

AMERICAN SCREEN CO.,
Brookline, Mass.

WESTERN ELECTRIC CO.,

Chicago, Boston, New York.

Electric Call-Bells and Annunciators,

For Hotels, Residences, Offices, etc. Electric Burglar-Alarms, Electro-Mercurial Fire-Alarms. Electric Gas-lighting Apparatus. Telegraph Instruments and Supplies.

SETTEES AND OPERA CHAIRS.

The Newest & Best Styles for SUNDAY SCHOOLS, CHURCHES, OPERA-HOUSES, LODGEROOMS, HALLS, OFFICES, &c.

Harwood Man'f'g. Co.,
91 Summer St., Boston.

Send for catalogue and state requirements.

Marble Mosaic Pavements,

Also Wall-Decorations in Mosaics, of either Marble, or Colored & Gold-Glass.

We employ Native Italian Artists specially trained for this work.

STILLMAN & NICOLL.
198-200 Tremont St. - Boston.

IMPERIAL GAS MACHINE.

DENNY BROS. & CO.,
34 Park Place, New York.

In use throughout the world. Send for descriptive pamphlet.

"OTTO" GAS ENGINE,

Guaranteed to consume 25 to 75 per cent less gas than any other Gas Engine per brake-horsepower.

Over 15,000 IN USE.

TWIN ENGINES

Impulse every Revolution.

The steadiest Gas Engine yet made.

ENGINES and PUMPS COMBINED

For Hydraulic Elevators, Town Water Supply or Rail way service. Special Engines for Electric-Light work Unexcelled for running Elevators, Wood-Tools, or any kind of Machinery.

SCHLEICHER, SCHUMM & CO.,
33d and Walnut Sts., Philadelphia. 214 Randolph St., Chicago.

ROYAL GAS MACHINE.

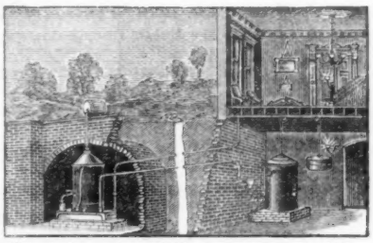
Hotels, Churches, Factories, Colleges, Asylums, Private Residences all use it.

Street Lamps, All Designs, Posts, Gasoline, Naphtha, Crude Oil, for Gas Works

No Smoke! No Smell!!!

ADDRESS
PENNA GLOBE GAS LIGHT Co.
47 & 49 No. 2d St., Phila. Pa.

THE only "Dry Blower" Gas-Machine made. No water about it to freeze. Makes gas for 75 cents per 1,000 feet.



Latest invention of the ihventor of the Dry Gas-Meter.

PITTSBURGH SUPPLY CO.,
(LIMITED.)
105 WOOD STREET, PITTSBURG, PA.

SEND FOR CATALOGUES.

THE COMBINATION GAS MACHINE CO.

DETROIT, MICH., and WINDSOR, ONT.,

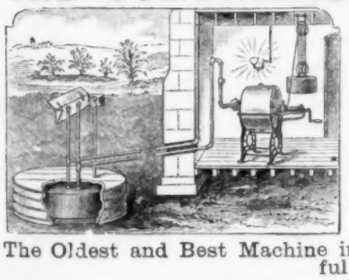
MANUFACTURE

GAS MACHINES

— FOR —

Lighting Churches, Hotels, Residences, Stores,

Or any place wanting artificial light.



The Oldest and Best Machine in use. Over 4,000 Machines in successful operation.

Send for Illustrated Catalogue.

TIRRILL'S EQUALIZING GAS MACHINE.

Makes Standard, Uniform Gas, wirhout Fire, Danger, Smoke or Smell, using plain Bat-wing Burners.

The only Machine in the world that can reliably do it. Send for circulars, and see who endorses this statement.

TIRRILL GAS MACHINE CO.
39 Dey St., N. Y.

SAMUEL FARQUHAR. **ESTABLISHED 1836.** DAVID W. FARQUHAR.

JOHN FARQUHAR'S SONS.

Slate, Copper, Tin, and Gravel Roofing.

Nos. 20 and 22 EAST STREET, BOSTON.

Order Box at Master Builders Association, 164 Devonshire Street. | **Special attention given to Repairs of all kinds.**

Inventors and owners of Farquhar's Patent Slate Fasteners, for securing slates to iron roofs, acknowledged to be the strongest method in use, and has been applied to many of the best constructed and largest buildings in this country.

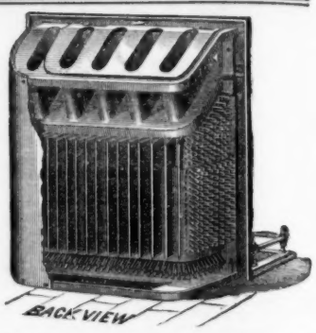
Contracts made for Work wherever desired.

THE
NEUCHATEL ASPHALTE CO.,
Sole Proprietors of the
Val de Travers Rock Asphalte Mines,
Canton de Neuchatel, Switzerland.
Val de Travers Rock Asphalte,
For Floors, Sidewalks, Roofs, &c., Durable, Fireproof, and Impervious.
For estimates and full particulars apply to office, No. 54 Astor House, New York.
HENRY R BRADBURY, Manager.

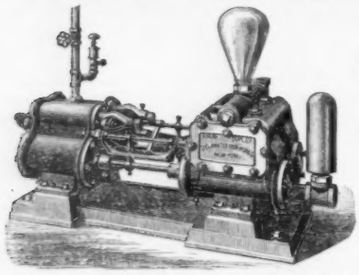
THE JACKSON
VENTILATING GRATE.

Send for Catalogues and for Reports, from your own State and neighborhood, showing large rooms heated, with out-door temperature at 40° below zero. Dining-room, or parlor, and chambers above, heated by one grate. Rooms perfectly ventilated with out-door air that has passed through the heat-saving chambers.

EDWIN A. JACKSON & BRO.,
77 Beekman Street, NEW YORK.



DELAMATER DUPLEX STEAM-PUMPS.



The most approved
STEAM PUMPS
Now on the United States' market for
Hydraulic Elevators,
House Tank Service,
Railway Water Stations, etc.
Water-Works Pumping Engines.
SEND FOR CATALOGUE.

DELAMATER IRON WORKS.,
40 Dearborn St., CHICAGO. **16 CORTLANDT ST., New York. Works, foot W. 13th St.,**

Furniture ! !

KEELER & CO.,

81 to 91 Washington Street,
Cor. Elm,
BOSTON.

Wood Mantels and Ordered Work a Specialty.

Estimates given on Architects' Designs.

K. B. & S'. ENGLISH.
GIBBS & CO.'S ENGLISH.
STETTINER GERMAN.
LAGERDORFER GERMAN.
FIEVE A 1 BELGIAN.
ROMAN CEMENTS.
KEENE'S CEMENTS.
Send for Circulars and Price Lists.

HOWARD FLEMING,
23 Liberty St., New York.
IMPORTER OF
PORTLAND CEMENTS
FROM THE BEST MAKERS.

JENKINS BROTHERS' VALVES.
Radiator, Gate, Globe, Angle, Check and Safety.
MANUFACTURED OF BEST STEAM METAL.
The Jenkins Discs used in these Valves are manufactured under our 1880 patent, and will stand 200 pounds steam pressure.
To avoid imposition, see that Valves are stamped "JENKINS BROS."
JENKINS BROTHERS,
71 John St., New York. Send for Price-List "A." **79 Kilby St., Boston.**

Water-Proof.

Air-Tight.

COMPLETE ROOFING.
Deadening Felt, Roofing Materials, Asphaltic Cement for damp walls, foundations, etc.
Send for Samples and Price-List.
WARREN EHRET ROOFING CO.,
Limited.
108 South Second Street, Philadelphia, Pa.

ARCHER & PANCOAST MFG. CO.
GAS-FIXTURES.

NEW YORK.
BOSTON. 12 West Street. **67 Greene Street. 68, 70, 72 Wooster Street.** **CHICAGO. 250-252 Wabash Ave.**

INSURANCE CO. OF NORTH AMERICA, - - of Philadelphia

Cash Capital	**$3,000,000.00**
Reserve for Re-Insurance	**2,156,781.63**
Reserve for Unadjusted Losses and other Liabilities	**473,492.82**
Surplus over all Liabilities	**3,250,778.61**

Solid Braided Window-Sash Cord.

The **SAMSON** cord is the most durable. Manufactured by
J. P. TOLMAN & CO.,
164 High Street, Boston.

Wilson's Rolling Venetian Blind.

A very DURABLE, HANDSOME and CONVENIENT piece of Window Furniture. It takes the place of the cumbersome folding shutters, saving the studding-out and boxing, and giving extra room. Can be fitted with lower sliding panel so as to close either half of window. Running in grooves, it does not shake or rattle, and is a protection against thieves.

WILSON'S ENGLISH VENETIAN BLINDS,
To pull up with cord. (See cut.)
Wilson's New Patent Double Edged
ROLLING STEEL SHUTTERS,
Fire and Burglar Proof. Will outlast three or four sets of any other make.
"The Hartford" Folding Blind and Wilson's Flexible Car Blinds.
Send for Illustrated Catalogue.
J. G. WILSON, 527 and 529 W. 22d Street, New York.

MY 100-PAGE ILLUSTRATED
CATALOGUE of BOOKS
On Architecture, Building, Carpentry, Drawing, Painting, Decoration, and Ornament, Drawing Instruments, Builders' Level and Architects Materials,
Sent on receipt of three two-cent stamps.
WM. T. COMSTOCK, Astor Place, New York.

Acme Window-Blind.
See Illustrated advertisement in Monthly Nos., or send for descriptive circular to Morstatt & Klatzl. Patentees and sole M'f'rs, 227 & 229 W. 29th St. N. Y.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII. Copyright, 1885, JAMES R. OSGOOD & Co., Boston, Mass. No. 505.

AUGUST 29, 1885.

Entered at the Post-Office at Boston as second-class matter.

CONTENTS.

SUMMARY: —
The Sewerage System of Berlin.—The Management of the Berlin Irrigation-Fields. — Hygienic Results of the System. — Archæological Research in Persia.— The French Mutual Defence Association. — ThePanama Canal. — Lightning and Telegraph Wires. — Cleansing Paint-Brushes. 97
THE CAMPANILE OF ST. MARK'S, VENICE. 99
A YEAR'S ARCHÆOLOGICAL RESEARCH BY THE GERMANS. — II. . 101
THE ILLUSTRATIONS: —
Casino Theatre, New York. — Tombs or Municipal Jail, New York. — Windsor Castle. — Cathedral, Ferrara, Italy. — The Campanile of St. Mark's, Venice, Italy. — The Piazza of St. Mark's, Venice, Italy. — Marble Statuary, Boston, Mass. . 102
GOSSIP ABOUT SALISBURY. — II. 102
BOOKS. 104
NOTES AND CLIPPINGS. 105

LA SEMAINE DES CONSTRUCTEURS quotes from M. Durand-Claye a brief account of the present condition of the system in use at Berlin for disposing of sewage. As is well known, Berlin had until within a few years no real sewers, and its entire system of drainage is the result of very recent study and experiment. The site of the city is nearly level, and it lies in the midst of a flat, sandy plain, far from the sea, so that no natural facilities existed either for collecting or disposing of the sewage, and it was necessary to weigh the advantages of all known methods with the greatest care in order to choose the one which would be most effectual and economical. Almost from the first it was decided to dispose of the waste liquids of the city by irrigation, and, although the temptation to reduce the amount of liquid to be dealt with by allowing surface waters to run into the river must have been great, the sewers were finally planned to take all the street washings, as well as house and manufacturing wastes. The natural fall obtainable being very small, it was necessary, in order to secure proper flushing, to divide the area of the city into twelve sections, each having its own net-work of sewers, discharging into separate receiving reservoirs, from which the liquid is pumped into the conduits through which it flows to the purifying fields. The main sewers are constructed of brick, with branches of vitrified pipe, and all portions are ventilated by numerous openings.

THE planning of the irrigation fields seems to have been quite as difficult a matter as that of the sewers. Unlike the purifying tracts of Paris or Edinburgh, the district which the Berlin engineers were obliged to use was not only low and flat, but presented a sandy upper soil about three feet deep, overlying a bed of impermeable clay, which kept the water which fell on the plain close to the surface, making the ground marshy during the greater part of the year. Such ground as this was very unfit for purifying large quantities of sewage, and it was foreseen from the first that unless a large area were used, saturation with foul liquids would soon take place, and the land would become pestilential. After careful investigation and experiment, it was decided that four thousand cubic metres ought to be about the maximum amount of sewage delivered annually on each acre of land. This is a much smaller dose than is usually allotted to sewage farms, and the city authorities were in consequence obliged to secure a considerable territory for its operations. They were prudent enough to do so at the outset, and the irrigation farms now include thirteen thousand acres, or about an acre for every eighty-four inhabitants of the sewered part of the town. Only about half of this is, however, at present under irrigation, the rest being kept in reserve for future use, or as fallow ground to be employed in alternation with the fields now irrigated. As fast as the irrigation pipes are laid, subsoil drains are put in, to maintain the filtration through the soil, and the subsequent aëration, which experience has shown to be essential to success in sewage farming. The outfall from the subsoil drains is into the natural water-courses, which flow sluggishly into the North Sea, and it was found at first that the movement was so slow that the ground became clogged with sewage; but a thorough clearing of the streams, and the removal of the weeds which choked them, soon freed the passage, and the soil is now easily kept in proper condition. We have no details of the mode of cultivation in use on the irrigated land, but it appears that during the last year the cost of caryring on the operations, which has hitherto been done by the city officials, was about three hundred and eighty thousand dollars, and the receipts from sales of produce about three hundred and forty thousand, the deficit of forty thousand dollars representing the cost of disposal of the wastes of nearly eleven hundred thousand people, besides the rainfall and street-washings of a large city. Now, however, the efficiency of the system having been established, negotiations are in progress with farmers for the lease of portions of the irrigated fields, and much of the territory has already been taken up, at prices which will bring to the city an annual profit instead of a deficit.

IT seems probable that the German engineers, using the record of the experience of others with the care and thoroughness characteristic of their race, have succeeded to an unusual degree in securing the benefits usually sought in the introduction of sewerage systems, but one is hardly prepared for such surprising results as those which M. Durand-Claye describes. According to him, the recent health statistics of the city show that in the portions not yet connected with the sewers there has been within a given time, we suppose a year, one case of typhoid fever to nine and three-tenths houses, and one death from the disease in every forty-third house; while in the sewered districts there was in the same time only one case of the fever to forty-nine and three-tenths houses, and one death from it to one hundred and thirty-seven and five-tenths houses. It must be remembered that Berlin is above all others a city of great apartment-houses, the average number of persons to a house being fifty-eight, so that these figures do not in either case show an extraordinary mortality from typhoid fever, but it is remarkable that the simple connection of the buildings with the sewers, without any change in the character of the drinking-water used in them should at once diminish by four-fifths the liability of their inhabitants to the disease. In fact, as the interior portions of the city, which are at once the most crowded and the least wholesome, have been the first to be provided with sewers, while the houses in the suburban circle, where the system is not yet complete, would naturally have fewer occupants, and those of a cleaner and better nourished class, it seems quite possible that a comparison of the numbers of individuals attacked, instead of that of houses, would show a still greater difference in healthfulness between the sewered and unsewered districts.

THE advance of European civilization into Central Asia, with the rapidly growing commercial activity of the region about the Caspian Sea, seems likely to lead before many years to the opening of the interesting country between the Caspian and the Persian Gulf to the labors of archæologists. Something has already been done here, at Nineveh by Layard, and at Persepolis by Victor Place, but the greater part of the field has not even been touched, and hundreds of questions of the greatest importance in ancient history remain to be solved by examination of the ruins which almost cover the ground of Eastern Turkey and Western Persia. An American expedition is, we believe, about to commence operations in Mesopotamia, but it is too early yet to expect results from its labors; and the most recent successful investigations seem to have been those made by a very modest little expedition, consisting of three gentlemen and a lady, which was sent by the French Government to study the ruins of Susa, the rich "City of the Lilies," which, as the capital, first of the Elymæan country, and later, of the Persian province of Susiana, was one of the most renowned Asiatic towns of antiquity. M. Dieulafoy, who directed the work of the expedition, had visited the place three years before, and was impressed with the idea that much lay beneath the uneven surface to reward judicious excavation, and the director of the national museum, M. Ronchaud, agreeing with him in this opinion, availed himself of a favorable opportunity to send him back there, accompanied by his wife, and with a civil engineer and a naturalist to assist him. As usually happens in that fanatical region, the labors of the party were seriously obstructed by the hostility of the people and the officials, who endeavored to prevent any one from working for them; but this gradually diminished, and before the two months of the favorable season were over, the excavations were considerably advanced. The middle of the site of the old city was, as it seems, occupied, after the manner of the ancient Persians, by an artificial hill, about a hundred and fifteen feet high, on which still remain the ruins of the palace of Artaxerxes

Memnon. The top of the mound is covered with earth and débris to the depth of ten or twelve feet, and this mass still retains many fragments, not only of the palace, but of more ancient buildings which stood upon or near its site. The most important discovery made by the party was perhaps that of a portion of the frieze which once encircled the palace. This frieze was of enamelled porcelain, thirteen feet in height, and the portion recovered measured, when put together by the careful hands of the lady, about thirty-three feet in length. Besides this, portions of several bas-reliefs were found, all in enamelled brick, representing personages with black skins, dressed in embroidered garments, and holding the long staff so often seen in Assyrian and Persian sculpture. These black dignitaries seem, according to M. Dieulafoy, to have been of Ethiopian race, and he considers it quite probable that some such family may once have ruled Susiana. Among the smaller objects found were seals, many of which, showing work of very different periods, were thrown up by the shovels of the laborers. One of these, cut on an opal, appeared to have belonged either to Xerxes or to his son Artaxerxes. Nothing of gold or silver was found, Alexander the Great, who is known to have plundered the city, having probably done so with the systematic thoroughness which experience might well have taught him, but a large collection of objects in ivory, bronze, glass and terra-cotta was made; and an enormous bracket capital in stone, similar in shape to those of Persepolis, but about thirteen feet long, was discovered. This was too heavy to be moved without machinery, but suitable apparatus has already been sent out from France, and when operations are resumed, as they will probably be as soon as possible, this, with such other large objects as may be found, will be transported to Paris.

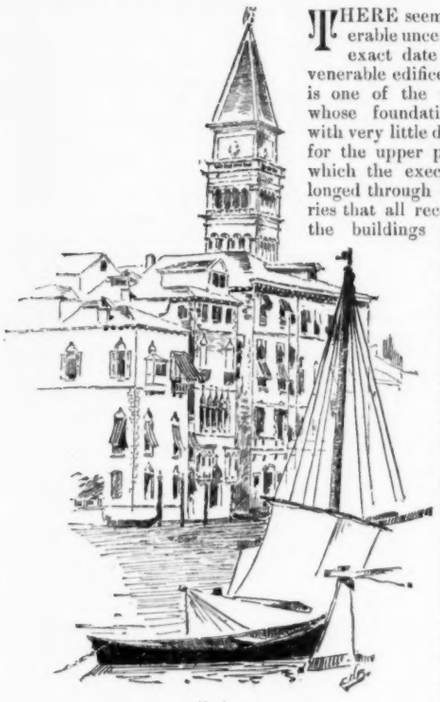
THE Mutual Defence Association, which was definitely formed two months ago among the French architects, has already entered upon its work, and is now pursuing, for the benefit of one of its members, a claim against an official body. The number of members has increased, and the conviction that the work of the Association will be of the greatest service to the profession seems to be steadily growing, one of the local societies of architects having recently been moved to show its appreciation in a sensible way by voting to send ten dollars to be added to the funds of the Association for the present year, "as an encouragement" to an enterprise "of such extreme utility."

WHERE is a singular discrepancy between the French and the American accounts of the progress of the Panama Canal, the former usually representing that the work is in active progress, and that everything indicates the speedy and successful completion of the great undertaking, while the latter assure us that only a small amount of actual excavation has been accomplished, and that the canal will soon be abandoned. At this distance it will be impossible to decide which story most nearly accords with the facts, but, recollecting that a good many of the unfavorable predictions which have been made in the New York journals about the canal have been already falsified, we are sometimes inclined to lean rather to the French view of the case. According to this, about half of the labor incident to severing the two continents has already been completed. Much of this, of course, was expended upon the construction of workmen's villages, hospitals, docks and other necessary preliminary works, but these are finished, the surveys have been completed, the line of the canal cleared, and about one-fourth of the material already removed, while contracts have been made for nearly all the rest of the excavation. The plans for the dam which is to turn the course of the Chagres River are completed, and an enormous mass of earth and rock from the summit cuttings at Culebra and Emperador is now in process of transference to the river-channel at Gamboa. The Culebra cutting is under contract to a firm which agrees to remove the material to a depth of two hundred and thirty feet below the summit level. This is about one-sixth of the entire excavation of the canal, but the trench will not even then be deep enough, and it must be dug fifty feet deeper still before it reaches the required grade. It seems from all the accounts that the story once published here, to the effect that the plan of carrying the canal through at the sea-level had been abandoned, and that a number of locks were to be introduced, is without foundation, and except a lock at the entrance, on the Pacific side, to check the rush of the tide through the canal, there will be no obstruction to the course of vessels from sea to sea.

BELGIUM, as is well known, is distinguished for the science of its meteorologists, particularly of the electricians, who have done much to advance the art of protection against lightning, as well as other branches of electrical engineering, by their accurate observations. According to *Le Mouvement Industriel*, some curious effects of lightning upon telegraph-wires have recently been noticed by the Belgian telegraph officials, the account of which is interesting to all who have to do with such matters. Early in June a thunder-shower passed over the province of Antwerp, during which eight posts of a short private telegraph line were struck by lightning, which totally consumed two of them. It was late in the evening, and the instruments in the offices at each end of the line had been grounded, in preparation for closing the day's business, but so slight was the effect upon them that the operators, who were still close at hand, did not notice it at all, and were quite surprised at learning the next day what had happened. That the absence of serious effect in this instance was due to the perfect earth-connection of the wires is indicated by comparison with another instance, occurring on the same day, in which the wire of an electric signal bell was struck, and, although the line was connected with a railway embankment made of cinders, the battery which supplied the current was entirely destroyed. Two weeks later another storm occurred, during which the line between Ghent and Bruges was struck, and several poles destroyed, one of which had been set two years before in the place of another destroyed by lightning in the same way. The discharge passed through the telegraph instrument in the station near by, melting the copper plates on the switch-board, and strangely enough, melting some of the plates connected with wires which ran in the direction opposite to that which led to the scene of the discharge. All the wires coming to the station were, however, gathered into a cable about twenty feet long before entering the building, and as the atmospheric currents would naturally have passed to the ground through the wires which it first reached, without breaking through a layer of insulating material to seek the same destination over another wire, the inference is that their transmission through one wire must have developed an induced current in the neighboring ones of sufficient intensity to melt the copper plates with which they were connected. These occurrences suggested to certain telegraph engineers the propriety of placing lightning-rods on their poles, as well as the usual lightning-arresters on the wires leading into the offices. It was necessary to use the simplest possible means for this purpose, and they made their lightning-rods out of two pieces of telegraph-wire, one on each side of the post, held by hooks driven into the wood, and twisted together into a point above the top of the post. Bits of galvanized wire connected the insulators with the rods, and the lower end of the latter were wound spirally three or four times around the base of the post, for an earth connection.

SO many of our readers are, as we know, addicted to amateur painting in oil, that we need not apologize for quoting from the *Painter* an account of a method for cleaning bristle, camel's-hair or sable brushes upon which color has dried. According to the *Painter*, all that is necessary in such cases is to set the unfortunate brush soaking in kerosene oil for a day or two. At the end of that time the bristles will be found softened and flexible, and, by working on a palette or board, the skin of hardened paint on them can be cleared away, leaving them in good condition for use. Even large house-painters' brushes can be cleaned in the same way, by a somewhat longer soaking in the oil and perhaps a little scraping. The action seems to be due partly to the solvent action of the lighter portions of the kerosene on the gum of the hardened paint, and partly to the softening of the bristles, but both are important, and while we should by no means advise an artist to be so careless as to leave his brushes dirty, with the expectation of cleaning them subsequently, we are willing to extend to the hard-worked and frequently interrupted amateurs of our profession the comfort of thinking that a favorite hog-tool, nicely worn, and of just the right shape and spring, is by no means irrecoverably lost if left a few days with hard paint on it; but that a judicious course of kerosene soaking and subsequent manipulation may restore it to prolonged usefulness, besides imparting to it, if we may believe the *Painter*, a soft elasticity which brushes cleaned in turpentine, however good naturally, do not recover until they have been used for some little time.

THE CAMPANILE OF ST. MARK'S, VENICE.



Venice.

THERE seems to be considerable uncertainty as to the exact date at which this venerable edifice was begun. It is one of the many buildings whose foundations were laid with very little definite planning for the upper portions, and of which the execution was prolonged through so many centuries that all records or data of the buildings were forgotten long before the superstructures were half finished. In the fifteenth century we know that the tower was in essentially the same condition as it remains to-day. Francesco Sansovino, son of the great Renaissance artist, has left us a large volume in which the various buildings of Venice are described and illustrated as they existed during his lifetime; and assuming his information to be exact, which however, is not a perfectly safe assumption, the foundations of the campanile were laid under Pietro Tribuno, the sixteenth Doge of the republic, in the year 888. Two hundred and fifty years passed, however, before the building rose above the level of the ground; but the upper portions must have advanced with much greater celerity, for we read that in 1329 the architect Montagnana was commissioned to restore the top. There is a rough wood-cut preserved in the library of the Doge's palace, attributed to Albert Dürer which shows the tower as it appeared after Montagnana's restoration. The only way in which it then differed from the present design was in the top, which consisted of an open loggia of wood, surmounted by a low pyramidal roof. This wooden upper story appears to have been several times destroyed. In 1400 while the Venetians were celebrating the election of the Doge Michele Steno, the fireworks started a conflagration which destroyed everything inflammable about the tower. Twice during the fifteenth century the campanile was badly damaged by lightning. On both occasions the wooden top was burned off, and once the thunderbolt tore away the whole north-east angle of the masonry clear to the ground. The extent of the damage done to the campanile at this time can still be traced by the difference in the style of brickwork where the destruction occurred. The only corner of the tower which has not been disturbed by lightning is that towards the south-west, away from the church. It finally occurred to the Venetians that stone would not burn quite so readily as wood, and consequently the present crowning loggia, attic and pyramid were added about 1550. Since then the tower seems to have been little disturbed by thunderbolts, although there are no lightning-rods of any sort upon it.

From its inception, the campanile appears always to have belonged more to the State than to the Church. The foundations were laid one hundred and fifty feet or more away from the Church of St. Mark, as it existed then; and when, during the twelfth century, the superstructure was begun, a ducal decree declared that the tower should belong both to the Doge's palace and to the Church. St. Mark's was then only a parish church, not having risen to the dignity of a cathedral. This joint ownership has always existed; indeed at present there can almost be said to be four owners, as the Prefect, the Archbishop, the Sindaco of Venice and the Chamber of Commerce all have some right in it, and claim a certain jurisdiction.

During the Middle Ages the Piazza of St. Mark was considerably smaller than it is now, as is shown by a large painting by Bellini at the Academy, dating from the close of the sixteenth century. The campanile was then built-about on three sides by a number of low buildings, which reduced the width of the piazza about seventy-five feet, and much interfered with the noble effect. Against the east face of the tower Sansovino had built an open balcony or *logetta*, similar in purpose to the Loggia dei Lanzi at Florence, but much smaller and more graceful in design, though having no part or connection with the huge old tower overhanging it. A few years ago the Logetta was in serious danger at the hands of the too zealous Commission for the Preservation of Ancient Monuments, which began to scrape all the beauty off of the delicately-proportioned members. Fortunately this scraping process was stopped before it was too late, and the restorations at present in progress bid fair to be very satisfactory. The buildings cluttered about the other sides of the campanile were in part removed under the Napoleonic régime, when the piazza was widened, though those at the north side did not finally disappear until about ten years ago.

The present appearance of the campanile is imposing in the extreme, especially when viewed from under the arcades at the farther end of the long piazza. The light work of the Logetta is then completely hidden, and the tower rises in all its simple, lonely grandeur, seeming to dwarf everything about it, and bringing the elaborate front of St. Mark's down to the scale of a child's toy. The tower appears to spring directly from the ground, the few low base-courses being too small to be noticed. The plain brickwork shoots up unbroken for more than one hundred and sixty feet, the sides drawing in slightly towards the top, giving the tower an appearance of being so securely planted that one does not feel the need of the buttressing which would so naturally suggest itself in a Gothic design. It seems like some great, strong giant, standing firmly upright under its load, and ready to face the storms and lightnings of another thousand years. Each side of the tower is marked by the long vertical lines of slightly projected pilasters, ending above with simple stone capitals connected by archings, in each of which is an inverted shell ornament of a type which shows that the uppermost portions of the tower cannot be more than five centuries old. The color of the brickwork is now a dull brownish red. At some period of its history it was covered with stucco, a great deal of which still adheres to the masonry in places. What its color formerly was is only a matter of conjecture, though by comparison with other Venetian work of the same character it seems reasonably probable that the tower was intended to be one bright, dazzling mass of white or light yellow. Certainly it never was red in any shade. We read in the old chronicles of the prisoner of state who was kept for many years in the dungeons of the Doge's palace, and then, when suddenly brought into the mid-day glare of the piazza, was struck blind by the dazzling brilliancy of the surrounding buildings. Had the campanile been a white tower, the piazza must indeed have been dazzling, with the dull white marble and gorgeous mosaics of the church to intensify the glare, for nowhere does the sun shine brighter than in Venice, and even with its present dull tones, the tower is sometimes a trying object to the sight.

Above the brickwork begins the fifteenth-century loggia, open on all sides, built of white and pale colored marbles. Inside are hung the four great bells which strike the hours, and are rung on public holidays. The view from this loggia out over Venice is exceedingly beautiful: there are no high buildings to obstruct the prospect, and the city lies spread out like a map, the long, low island of Lido stretching between us and the sea off to the east, and away to the north and west the line of the mainland, backed by the purple mountains of the Tyrol. From this loggia, too, one can examine closely the details of the campanile, though even in the upper Renaissance portions the details are few and simple, as they should be to chime with the grand simplicity of the general idea. It is noticeable how nicely the parts of the tower harmonize. There is no abrupt termination of the rough brickwork, nor sharp contrast with the white stone above; but the inconspicuous brick pilasters end naturally in the slightly-marked capitals, connecting the brownish lower tones with the plain frieze and boldly projected cornice, so that the fifteenth-century loggia seems to grow out of the twelfth-century substructure. After all, there is nothing quite so effective as good, plain masonry and plenty of it, with a few decisive mouldings. Probably the simplicity of the campanile which seems so admirably balanced now, arose more from barrenness of ideas on the part of the builders than from any studied scheme, but the result is none the less successful. Many of the noblest ideas in art have been evolved by accidental combinations. Surely none of the numerous carefully designed Renaissance towers scattered through Italy can in any way compare with this grand old piece of patchwork. It is almost a wonder that when the bare brick walls of St. Mark's were covered with rare marbles and rich-hued mosaics, the Venetians did not case the campanile in like manner. It would be interesting to know whether such a method of decoration could not be carried out more successfully than it was on Giotto's tower at Florence. Still, one would prefer the plain brickwork.

The best part of the campanile ends with the cornice of the Loggia. The balustrade above with its slender bronze shafts, the high attic with Venice and the lion planted on each face; the steep, green, copper-covered pyramid forming the roof, and the flaming golden angel crowning the summit, are all interesting in a certain way, but seem a little weak as compared with the rest of the building, and hardly serve as a fitting superstructure for so simple a base. Better to have stopped the tower square above the loggia cornice, as was done in the Florence campanile. But then, the Italians never have produced a perfected type of tower termination. This is perhaps the best attempt which has been made, and long acquaintance makes it seem right, even though sober criticism does not wholly approve.

The platform of the loggia is reached inside the tower by an easy ramp, making the ascent in thirty-six turns. The plans and section illustrate the internal arrangement of the campanile, and the manner in which the ramp is built up. The outer walls average five feet in thickness, exclusive of the outer pilasters, and are plumb on their inner faces. Inside the tower are eight great piers about forty-two inches square, extending the whole height. It is interesting to note the manner in which the difficulties of properly supporting the ramp

are overcome. A continuous, inclined barrel-vault would have been impracticable. The plan followed disposes of any thrusts naturally and simply, and has besides the merit of ease of construction. The plate shows a plan and section of the tower which will illustrate this arrangement. There are no ties or anchors in any part of the masonry. A few heavy cross timbers are found built into the outer walls and the inner piers, but these were probably used only during construction, and have generally been cut off so as to form no tie. The only bonding is in the loggia, where the builders did not quite dare to trust the arches to themselves, and as in nearly every piece of Renaissance construction, put two heavy ties in each arch.

The attic is constructed entirely of brick, with facings of white and light-colored marbles. The walls are 70 cm., thick, rather heavy construction for such a height. The balustrade encircling the tower at this level is open all around, the attic setting back 60 centimetres from the face of the loggia. The bells of the tower, weighing in the aggregate 35,000 pounds, are hung from heavy wooden trusses resting on the inner columns of the loggia. The pyramid is also of brick, the outer mouldings being of white marble, while the copper covering is laid over boarding secured to the masonry. The figure of the angel at the top of the pyramid is of wood covered with copper. It is 3.25 metres high, and forms one of the largest single weather-vanes in the world, as it turns on the rod which supports it so as always to face the wind. This vane has been in operation for more than three hundred years, and is still considered very reliable by the Venetians. The rod extends down about seven metres, and is stayed by an arch turned across the interior of the pyramid.

The total height of the brickwork forming the main shaft of the tower is 53.66 metres; and to the top of the cornice of the loggia the height is 62.66 metres. The attic is 9.45 metres high; and the entire height of the campanile from the upper base-course to the auriole around the angel's head is 97.61 metres, as measured by the writer, or 98.31 metres from the present level of the piazza. The building is not perfectly plumb, inclining slightly towards the northeast, in the direction of St. Mark's. It is not an exact square in plan, the dimensions being, at the top of the base course, 12.90 metres by 13.25 metres, and at the loggia, 11.56 metres by 11.724 metres. The attic is 10.320 metres by 10.356 metres.

The most interesting constructional part of the campanile is under ground. Indeed when one considers how heavily the tower is built and bears in mind the treacherous nature of the soil upon which it rests, the question is naturally suggested, What foundations could be sufficient to properly sustain the enormous load? For its area the campanile is one of the heaviest isolated structures in the world, and at the same time the location is about as poor as could be chosen for so weighty a building. The islands on which Venice is built are composed principally of a mucky, alluvial clay, the upper layers of which look like black mud. Deeper down the clay becomes quite firm, though never as stiff as our blue clay. The stratum is of varying thickness, from a few inches to a hundred feet, and lies immediately over a bed of sand which practically has no hard bottom, while it is so full of water as to give little support to piling which may be driven into it. The tide rises freely in the ground everywhere to within a few feet of the surface. On such soil as this is the campanile built. The writer searched in vain through the Venetian libraries for any exact documents relative to the foundations of this building, and was finally obliged to investigate the tower itself, in order to ascertain the conditions under which stability is ensured to the heavy mass. A recommendation from the Archæological Society, an endorsement from the engineer of St. Mark's, a street license from the Sindaco, an approval from the Commission for the Preservation of Ancient Monuments, and a permit from the Prefect had to be obtained before a hole could be started at the northwest corner of the campanile. But Italians are more lenient to strangers than they are to each other, and a little of the red tape was waived, so that the excavation was more than two metres deep before the last permit was made out. After the work was begun, it was ascertained that ten years ago when the last building was removed from the base of the campanile, an excavation was made to determine the nature of the foundations; but all of the masonry was not uncovered, and the observations must have been very carelessly taken, as the results do not in the least agree with what was found by me. A great deal of local interest was taken in the investigations, and some curious ideas were brought forward by a few individuals who could not quite understand why the tower should be enclosed by a high board fence and the piazza half flooded with dirty water. In the course of the excavations a few old cattle bones were unearthed, and one of the papers made it a pretext for statements which drew some interested spectators to the town to see the "*bêtes*" which were said to form a portion of the foundations.

It was also found that several self-styled authorities had evolved from the inner consciousness of their own minds exact data as to the construction and arrangement of the foundations; and one pamphlet which an officious individual persisted in bringing to my notice, had hypothesized a section of the substructure, showing it spreading out in a wide pyramidal form, totally different in every respect from what was really found to exist. The excavation was attended with considerable difficulty, the water working through the loose upper soil, and causing this to wash down so fast that sheet-piling was necessary. Every morning the pit was found full of water, and at least two men were kept at the pumps all day. Believing that this is the first time the campanile foundations have been thoroughly investigated, it seems worth while to describe them in detail, as such construction cannot but be of interest to many architects in America who have to build under exactly similar condition of soil, etc.

The width of foundation uncovered was about one metre. The ground where the excavations were made had been covered by low buildings up to within ten years since, as previously stated, but these had been so effectually removed, that in digging no traces were found of them, though it is doubtful if their foundations could have extended very far. At a depth of 86 centimetres below the level of the present piazza an old pavement was uncovered, which from its position and the appearance of the bricks with which it was laid, was probably a portion of that which was put in place during the fifteenth century. We know that the piazza and all the surrounding buildings have been sinking into the earth ever since there have been any historical records. Indeed the movement is not confined to Venice alone, for a considerable portion of the lower valley of the Po and adjacent streams have been slowly changing level, as is proved at such places as Padua and Ravenna, where old Roman pavements have been unearthed at a depth in some cases of as much as twenty-five feet below the present surface levels. The causes of these settlements I would not undertake to explain, but there can be no doubt that St. Mark's and the campanile once stood much higher than they do now. In the painting by Bellini previously referred to, both of these structures are shown a full metre higher than they are now. This movement has been so even and gradual that only in the course of centuries can it be detected, but when a city is built as low in the water as is Venice, any settlement of this kind may have a serious effect upon the buildings. It must be remembered that the tide rises to within nearly a foot of the present level of the piazza, while during the high tides of spring time the square is not infrequently so flooded with water that the gondolas can come up to the very door of St. Mark's.

The accompanying figures [see Illustrations] show the actual arrangement of the foundations of the campanile. The brickwork of the superstructure, it will be seen, rests directly upon five nearly equal courses of roughly-dressed stone, most of which is hard limestone. Three of these courses show above the present level of the piazza, and constitute all of the visible base. Immediately below these courses is a band of red Verona marble, 12 centimetres of which are above the level of the fifteenth-century pavement. The writer is inclined to believe that at one time the upper limestone courses were faced with marble on a line with the lower marble course, thus making a solid base for the campanile 1.46 metres high, and 64 centimetres wide on top, as shown by the figures here given. This is entirely conjecture, however, as there are no indications of ties or anchors which might have secured such a facing; still a base of this description would add greatly to the appearance of the building, and would be by no means without precedent among just such structures of the same period.

Below the Verona marble were found three courses of Istrian limestone, followed by two courses of a brownish trachite with which were used a few blocks of yellow sandstone and yellow trachite. Some of the limestone bore marks which seemed to indicate that the blocks had been taken from some previously existing structure. Indeed the irregularity of the courses and the diversity of materials employed would lead one to believe that the builders simply utilized whatever material was at hand, without much uniformity of constructive planning. The Istrian stone used is exactly the same in quality as that which the Venetians still employ for foundations: a firm, close-grained material, rather hard to work, and possessing great strength. The masonry of the foundations is all laid in lime mortar of a rather poor quality. The tide-water rises in the ground nearly to the level of the old pavement, hence the work is constantly subjected to the action of salt water. The mortar was found to be much disintegrated, possessing little consistency and crumbling in the hand like hardened mud. The lime for the mortar was apparently made from Istrian limestone of the same quality as that used in the building.

The lowest course of masonry is of green porphyry. The stone uncovered was a fine specimen, being shot through with small white crystals of feldspar and bits of black mica. Why the builders ever selected porphyry for such a place we do not know: perhaps it was cheaper to rob some old building than to send to the main land for large blocks. The course measures 90 centimetres in height, and the individual stones must be very wide, as there was no vertical joint uncovered in the width of the excavation.

No attempt was made to ascertain the nature of the foundations under the inner portions of the tower, but it is fair to assume that the masonry is one solid mass. The work uncovered is in well defined courses of different heights, and the blocks are all more or less carefully dressed to a surface.

The masonry of the foundations was found to rest directly on a platform composed of a double thickness of wooden beams, each 12 centimetres through, placed crosswise over each other. These in turn were borne by the piles, which, so far as could be determined, were driven side by side in continuous rows under the whole of the building. It was of course impossible to find out how long the piles were, but the diameters being on an average 24 centimetres, they probably extended a considerable distance into the heavy black clay composing the soil. The piles seemed to be of oak, and the platform beams of larch, a wood similar to our yellow or hard pine, though all of the woodwork was so thoroughly soaked in water, and blackened with age that it was difficult to determine very much about it. The

platform beams seemed the least well preserved. The wood could be broken off the outside with the hands, though the inside of the pieces was quite firm. The piles did not seem to have deteriorated in the least, but were as sound and tough as sap-wood. Large samples were cut from both piles and platform, but at this writing the water has not sufficiently dried out to say how free they are from rot. It is surprising that the wood has lasted as it has for nearly a thousand years. The water circulates very freely among the timbers, and during the time of making the last metre in depth of excavation, seven men had all they could do to keep the pit clear. The water flowed into the trench only through the timbers of the platform, and was quite clear and salt, showing it came directly from the sea. No wonder under such conditions that the wood should be stained and softened.

An extra row of piles was found driven just outside of the platform, and entirely free from any direct bearing. That the settlement of the campanile has been relative rather than absolute is proved by the fact that the tops of this outer row of piles are exactly on a level with the tops of those which bear the platform. This also shows that the slight obliquity of the tower is due not to any failure of the foundations, but rather to the general movement of the earth, for the tip is towards the side at which the excavation was made, and any derangement of the piles could easily have been noted. The weight coming upon this foundation is something tremendous. The bricks of which the superstructure is laid are very large. One of them which was measured was 44 centimetres by 30 centimetres by 7.5 centimetres, — about ten times the size of our common bricks. The masonry laid up with them will average about 105 pounds per cubic foot. These bricks are so large that they are made with two holes in the centre, by which the workmen can lift them about. Most of the bricks bear a stamp of some sort, and those who have studied the matter are able to tell pretty closely the date of a building by the stamps on the bricks.

Stamp on a Brick of the Campanile.

It was said above that the campanile is one of the heaviest buildings in Europe for its size. The average area of masonry in cross section of the main shaft is 873.74 square feet, or nearly fifty-two per cent of the total area of the tower. Counting the brickwork at 105 pounds per cubic foot, and the stone-work at 150 pounds per cubic foot, and allowing for bells, trusses, etc., the total weight of the tower is in round numbers 13,000 tons, whence the distributed load on the piling is somewhat over six tons per square foot, a load which would cause modern engineers to hesitate a long time before putting upon piles which are simply driven into the clay. The foundations have, however, stood the test of several centuries without yielding an inch; and one of the most valuable results of the investigation has been to fix a maximum of load which can safely be borne under such conditions. It is an interesting question how much the piles really support, for as previously explained, they have no solid bearing, and according to the manner in which piles are usually driven in Venice, could not be relied upon for such a load as six tons per square foot. It is more than probable that their function is simply to hold the clay in one compact mass, the clay itself really bearing the load. Possibly such an hypothesis would explain why the builders added a row of piles entirely outside of the face of the foundations and affording no direct support, with the idea of binding the clay more tightly about the base of the tower. Very similar conditions have existed in our own country. Those who are familiar with St. Louis will remember that under the main portion of the city is a thick bed of blue clay, beneath which is a deep stratum of very soft earth or mud. When the post-office was built, the Government architect decided that the foundations should be sunk very deep, thinking perhaps to gain additional firmness; but the bed of clay was so nearly cut through that when it was attempted to pile for the foundations, the piles penetrated entirely through the clay, and were of hardly any more value for support than the surrounding soil would have been without them. Captain Eads in his report on the condition of the building, expressed as his belief that the only thing which held the foundations was the lateral friction of the piles against the clay through which they were driven, a rather uncertain factor to depend upon for so important a building. In the case of the Campanile of St. Mark, the conditions are exactly the same, except that the builders probably did not drive the piles through the clay. The Venetians have always been aware of the danger of sinking the piles too deep, and in works of which we have definite record, great care has been taken to ascertain the thickness of the stratum before beginning operations; and in some cases where the clay has very little depth the piles are even omitted entirely, for Venice is not altogether built on piles, as is sometimes stated, and the stiff, black clay has been found capable of bearing a pretty heavy load without serious displacements.

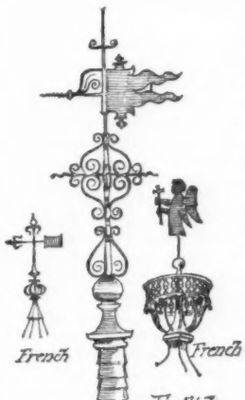
In this connection it may be interesting to note the construction of the foundations under the Doge's palace, the data for which were given me by Signor Boni, the architect in charge of the restorations of the palace. The accompanying figure [see Illustrations] shows a section of the foundations under the row of columns facing the sea. The work dates from 1309. Here the layer of clay was probably found to be too thin for piling, consequently the work was begun on what we would term a mud-raft, composed of two layers of heavy larch beams twenty centimetres thick, laid crosswise over each other. This receives directly the six foundation courses of Istrian limestone. This construction is continuous the whole length of the building. A piece of the wood taken from the raft was as sound and firm as a piece compared with it which had been cut only a few weeks.

For more modern Venetian buildings the work of preparing for the foundations is not done as carefully as that which is found under the campanile or the Doge's palace. Piling in Venice is not a scientific operation. Half-a-dozen men supply the power; the drop of the hammer is not more than an arm's length; the piles are driven as closely together as the soil will permit, the interstices filled with fragments of broken stone, and a double layer of planks laid over the whole, on which the masonry is begun. Generally the bases stand pretty well; indeed the results are in appearance more satisfactory than they are in Amsterdam where more care is expended on similar operations.

One does not usually expect to find much of a practical nature in Venice. The climate is so soft, and the surroundings so inviting to idleness; and it hardly seems as though the mild-tempered people who go singing across the piazza could be in any way related to the master-minds who centuries ago built the wonderful St. Mark's, and laid deep the foundations of the campanile. But we find there are practical problems which even Venetian builders are called upon to solve, and a study of Venetian methods may not be without value to sterner New England.

C. H. BLACKALL.

A YEAR'S ARCHÆOLOGICAL RESEARCH BY THE GERMANS.[1] — II.



PASSING from the barbarous north to Greece itself, we find that recently much light has come from its ruins to profane, as well as to sacred, architecture. The treasuries, built by different Greek cities to hold their gifts at the shrines of Olympia, known to us only through Pausanius's naïve account, were brought to light by the German excavations from 1875–80. But only very recently has Dörpfeld been able to prove that as the Sicilians sent over by ship the terra-cotta decoration and tiles necessary for the treasury at Olympia, so also the people of Sicyon sent thither from their city blocks of stone, already hewn into shape and marked with their peculiar alphabets, preparatory to building into their treasury. The same keen-eyed architect has happily been able to prove that Scopas's great temple at Tegea was surrounded by thirty-six Doric columns, but had florid details in the *sima*. And it is most painful to hear his report of the destruction going on of the few architectural fragments that remain. What was to be seen in 1880 has now, for the most part, disappeared, the peasants having used it for building purposes. Dörpfeld's study of Philon's recently discovered inscription throws invaluable light not only upon the forms of a great projected naval arsenal, but also upon many details of roofing in Greek architecture hitherto entirely obscure. From the accurate accounts of the mode of construction given in the inscription it seems that the roofing of Philon's arsenal was to be of wood. Over this covering of wood came a coating of clay, which formed a firm bed for the terra-cotta tiles fixed in it, thus making a most complete protection to the perishable wooden beams underneath. It is interesting to learn that the woodwork was not flat, but in order to hold the clay in place, the sloping surface was full of elevations, much as the brickwork of our day intended for a stucco facing. Still, one other fact of great interest for Greek architecture in general is that the rows of pillars of this arsenal did not stand on one united stylobate, but each pillar had its own individual foundation, and this more economical mode of building appears to have been employed even for the interior columns of the Parthenon.

Students of history will hail with delight the discovery of the exact site of the shrine of Artemis, which gave name to one of the greatest naval conflicts of the Persian wars. Few remains have been found of the small Doric temple there, it having been early transformed into a sanctuary of St. George, where, until within a few years, liturgies were sung on the day of that saint. But although little of the ancient Greek structure remains, a knowledge of its exact site is of greatest importance in making more clear our view of the difficulties which the Greeks had to contend against in gaining their glorious victory at the battle of Artemesium.

In the *Mitheilungen*[2] our attention is turned by Köhler to a

[1] Continued from No. 504, page 94.

[2] "*Mittheilungen des Deutschen Archäologischen Instituts in Athen.*" Achtu Jahrgang.

somewhat striking discovery in Athens of the fragments of an old grammar engraved on marble. It has always been supposed that before Alexander's time the Greek mind was still so pristine in its creative power that no commencement had been made in the production of works of an introspective and reflective character. It has consequently been said that grammar and kindred sciences, in spite of Plato's mention of a grammarian, must have been the growth of a later day, when, the original creative source running low, men began to ponder on themselves and their speech. But this marble monument, found very recently in the Acropolis, and, by reason of style and shape of letters, dated with great certainty from the pre-Alexandrine age, throws a most welcome ray of light into the midst of these conjectures. Here is preserved to us a fragmentary page of an ancient grammar engraved on a marble tablet. Although it has been made to do some menial service (possibly as a door-sill), and thereby has become much worn, still enough remains to make clear that here the vowels and the division of words into syllables are discussed. This marble was found in the Acropolis, and it may seem strange to us that in the shrine sacred to the goddess it should have been brought to light. As, however, in those olden days in order to introduce a work to the public there was not the now indispensable publisher with elaborate paraphernalia of trade, the writer has led himself to advertise his work in the most public places, and these were the precincts devoted to the gods. Here the public continually congregated, and every new object must have received attention. An additional motive for setting up his work in marble or bronze was doubtless the author's desire to dedicate a portion of his bust as a votive offering to deity in his shrine. Thus did the astronomer Oinopides form Chios, for after completing his important reckonings with regard to the intercalary period, we are told that he had them engraved on a bronze tablet and consecrated to the gods on Olympia. So it seems most probable that some Athenian grammarian put up in Athena's shrine this marble tablet.

Here is another proof of how the ancient Greek life drew vivifying force from the ideals and impulses of its beautiful religion, but of this there have come to us still other speaking testimonials from tombs in the Crimea of the colonists there who drew upon Athens for their art necessities. In one have been found the hangings of an exquisite diadem. But although these are in gold and opaque blue and green enamel, and thus of greatest interest technically, their importance does not rest here. The subject on the superb medallions represents not anything obscure or local, but the head of the great tutelary diety of Athens, the Athena Parthenos by Phidias. In addition, from the richly elaborated gold treasures we learn many details about the master's great chryselephantine colossus, of which it has been impossible hitherto to form a clear conception from the marble repetitions, or from small and much worn coins. In these Crimean medallions not only the beautiful finish given to every part in the golden original seems reflected, but we see also that Athena's owl had a striking place. It is not simply decoration, as hitherto supposed; rather as the goddess's little companion, the bird was perched upon the cheek-piece of the hemlet. From the ancient character of the architecture of the tomb where these beautiful medallions were found Kieseritzky adjudges it to date back as early as the first part of the fourth century before Christ. Thus it is most probable that some goldsmith in Athens copied, even in the age of Phidias himself, the master's great work, then a wonder and delight to all. Copies such as these are doubtless before us in the superb medallions exported to the Crimea, (ancient Panticapæum), where they were laid away in the tomb with some Greek lady, in death as richly decked as in life.

From these full publications of the Archæological Institution light is shown not only upon the intricacies of ancient trade, that medium in the spread of religious symbols and thought, but also on much more at which we can only hint, such as the history of the Greek alphabet, the development of custom, the variety of artistic gifts among different nationalities, etc. But, even though space be limited, we must not omit to refer to the skill of Mommsen and his coadjutors in ferreting out modern falsifications of inscriptions. A certain Dr. Gay published as long ago as 1861 an inscription which he reports having found in Northern Africa near Ben Kedour. He even mentions the dimensions and guarantees the reading he gives. Taken in good faith, this was introduced among other inscriptions from Africa into the great Corpus, and so passed out as genuine among scholars. While, however Mommsen and Hector Pais were recently working at the inscriptions in the Turin Museum they suddenly recognized the original Latin inscription which could have been no other than the one that Dr. Gay had copied and taken to Africa, only altering the word Alpina to Mauritania to suit the inscription to the new land in which he chose to find it. Suspicion rested on still another scholar, one Edmond Blanc, Librarian at Nice, and Hector Pais was sent by the Accademia dei Lincei to compare the inscriptions published by Blanc with the stone originals, in however inaccessible sites they might be hiding. This he did with great fidelity and no little hardship, proving that Blanc was guilty of having not only modified and interpolated inscriptions, but also of having created some out of his own brain. By this untruth on Blanc's part suspicion is now cast upon all that he has published, and his contributions take an unenviable place alongside of those of Ligorio, Pittakis, and their fellows, but science gains by being freed from its most dangerous enemy, an incubus of falsehood. — *Lucy M. Mitchell in the New York Times.*

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

THE CASINO THEATRE, NEW YORK, N. Y. MESSRS. KIMBALL & WISEDELL, ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print, issued only with the Gelatine Edition.]

We regret that it has not been placed within our power to publish either plans or other drawings, or even a description of this building which we have been given to understand possesses many points of interest. As we have never seen the building except for the few moments required for making the negative for the view published to-day, we can only say that in its construction an unusual amount of terra-cotta has been used, which has enabled the architects to secure a richness of effect that could have been obtained in no other way so inexpensively.

We cannot forbear once more remarking, in face of the fact that this print falls far short of its proper importance and value to the profession through our being obliged to put it forth unexplained by plan or description, how much the editors are handicapped in their efforts to do their full duty to the subscribers through the inexplicable lack of spontaneous co-operation on the part of the profession.

THE TOMBS OR MUNICIPAL JAIL, NEW YORK, N. Y. MR. JOHN HAVILAND, ARCHITECT.

[Gelatine Print, issued only with the Gelatine Edition.]

Had we discovered earlier that certain alterations are now making in this building, under the charge of Mr. Le Brun, we might have obtained other illustrations and information to lend interest to the bald fact that this prison was built about 1834–37. Mr. Haviland was born in England in 1792, and died at Philadelphia in 1852, having emigrated to this country in 1816. He is said to have been, perhaps, the first to use the radiating system in the planning of prisons, of which he built many of the earlier in this country, as, for example, the State penitentiaries for New Jersey, Missouri, Rhode Island, and those at Pittsburgh and Cherry Hill, Pa.

WINDSOR CASTLE, AFTER AN ETCHING BY LUCIEN GAUTIER.

Lucien Marcellin Gautier was born at Aix (Bouches du Rhône), and was a pupil of Gaucherel. He has contributed several etchings to *L'Art*. Among his plates are several views in Marseilles, "The Forum," "Lake Lomond," "The Apse of Notre Dame," "The Cottage," "Windsor Castle" and "The Canal" (after Corot). M. Gautier is a young man, we believe, but has produced some etchings of great merit, and bids fair to win much fame, more especially as an etcher of architectural subjects.

THE CATHEDRAL, FERRARA, ITALY.

The Cathedral of St. Paul, of whose façade Fergusson says that it "stands preëminent for sober propriety of design and the good proportion of all its parts," was begun about the middle of the twelfth and was completed during the following century, though the central portal and some of the sculptures are of still later date. The Renaissance campanile was built in the time of Ercole II.

THE CAMPANILE OF ST. MARK'S, VENICE, ITALY. MEASURED DRAWINGS BY MR. C. H. BLACKALL.

For description, see article elsewhere in this issue.

THE PIAZZA OF ST. MARK'S, VENICE, ITALY.

MARBLE STATUARY ON THE EAST FRONT OF THE POST-OFFICE, BOSTON, MASS. MR. DANIEL C. FRENCH, SCULPTOR, CONCORD, MASS.

GOSSIP ABOUT SALISBURY.[1]—II.

THE ENVIRONS.

Within easy access from the town, many interesting excursions may be made. The archæologist can visit Old Sarum, Stonehenge and Avebury; the artist, Wilton House and Longford Castle; while the general public can walk upon the sites of many events in early British, Anglo-Saxon and English history. Stonehenge should be visited on a dull autumnal day towards sunset, when the mists encircling the stones lend grandeur and mystery to them. On a bright day, when one sees the enormous stretch of country all around them, one is not impressed by their magnitude. Many are the theories held about them. The first author who mentions them is Henry of Huntingdon, who wrote at the beginning of the twelfth century. In his "*Chronicle*," he speaks of them as the "second wonder of England," and calls it "*Stanenges*." Geoffrey of Monmouth, who wrote

[1] Continued from page 66, No. 502.

No. 505. American Architect and Building News, Aug. 29, 1885.

COPYRIGHTED 1885, JAMES R. OSGOOD & CO.

"Labor"

"Science"

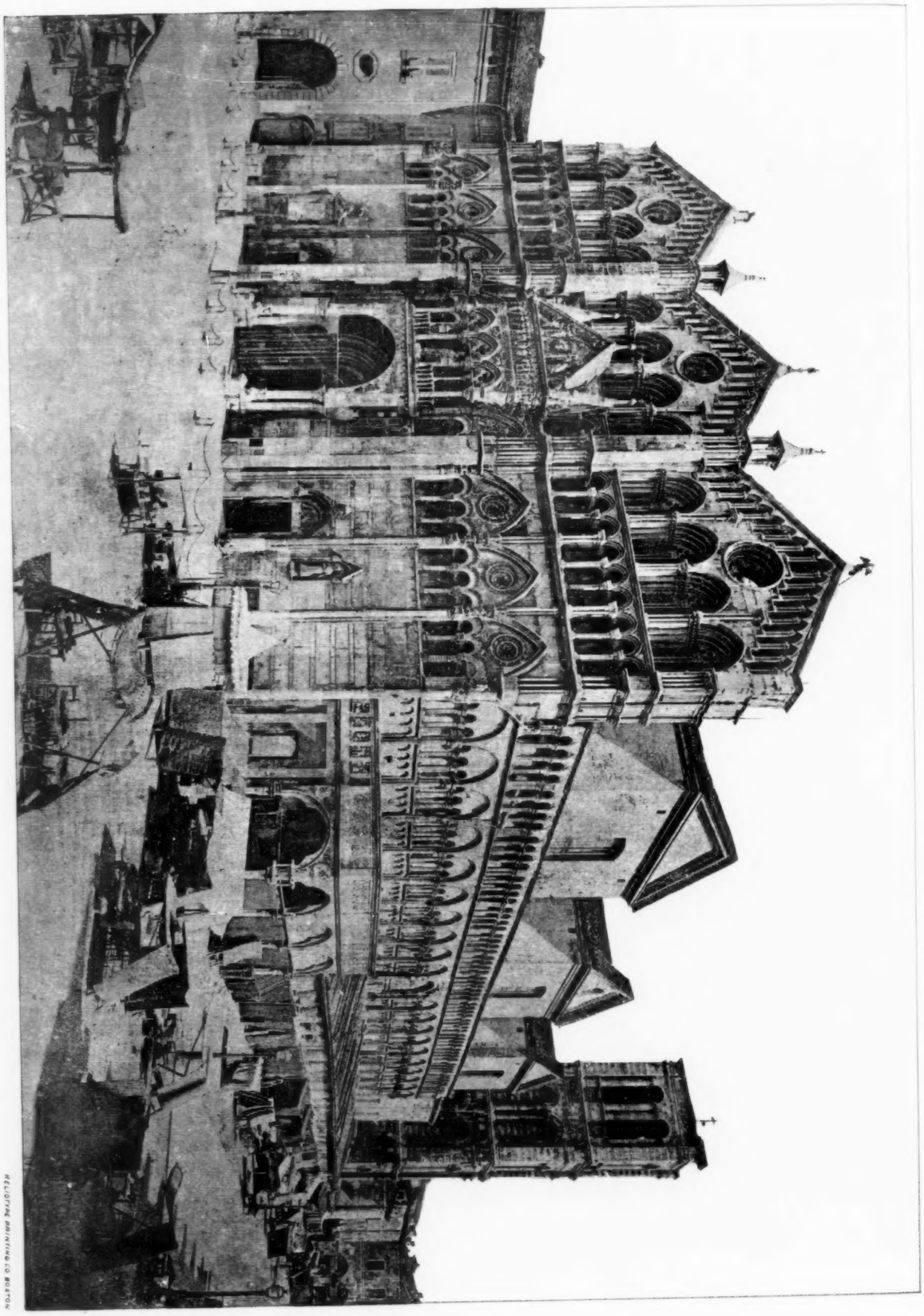
DANIEL C. FRENCH,
SCULPTOR.

MARBLE STATUES, NEW FRONT OF POST-OFFICE, BOSTON, MASS.

FROM PHOTOGRAPHS.

HELIOTYPE PRINTING CO., BOSTON.

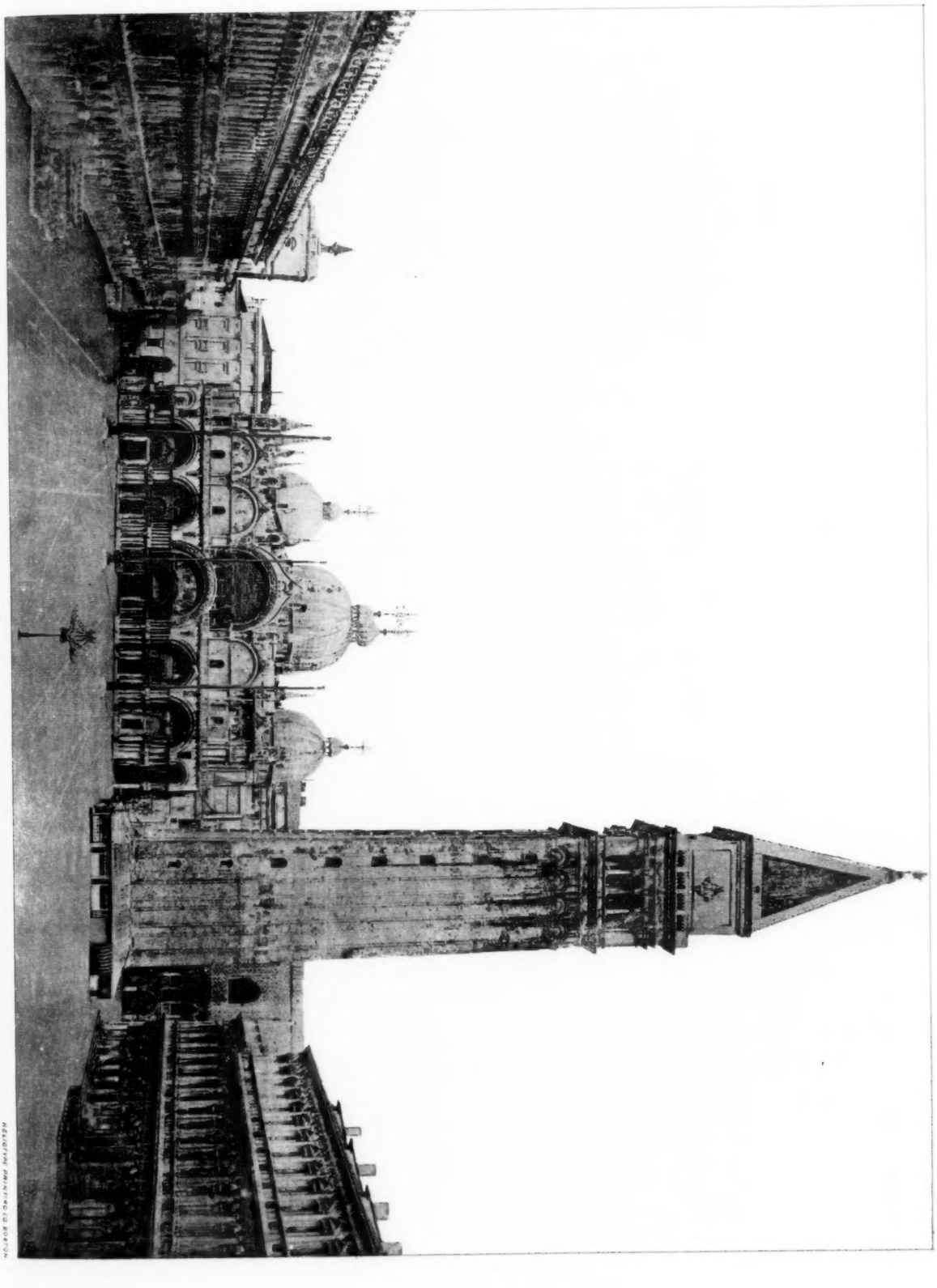
COPYRIGHTED 1885 JAMES R. OSGOOD & CO.



The Cathedral, Ferrara, Italy

HELIOTYPE PRINTING CO. BOSTON

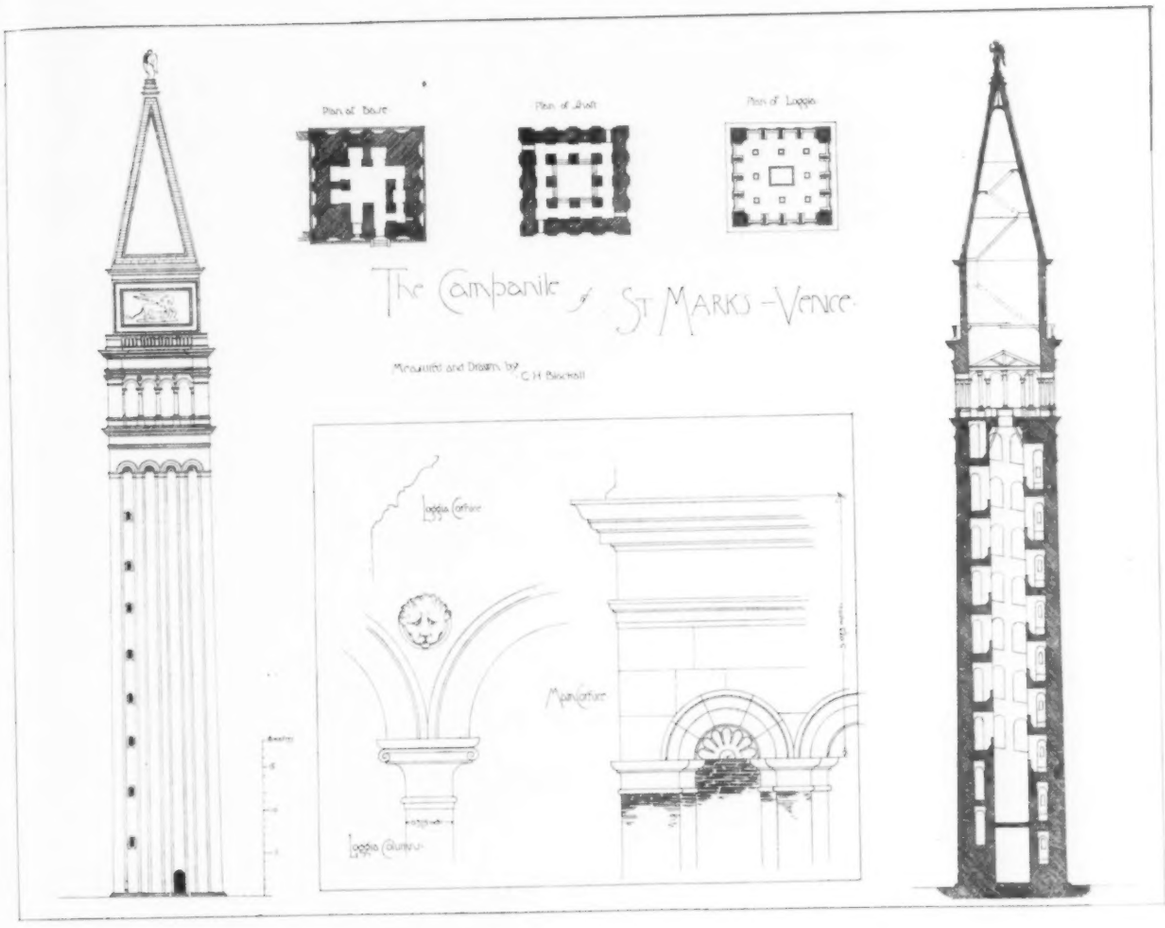
COPYRIGHTED 1885 JAMES R. OSGOOD & CO.

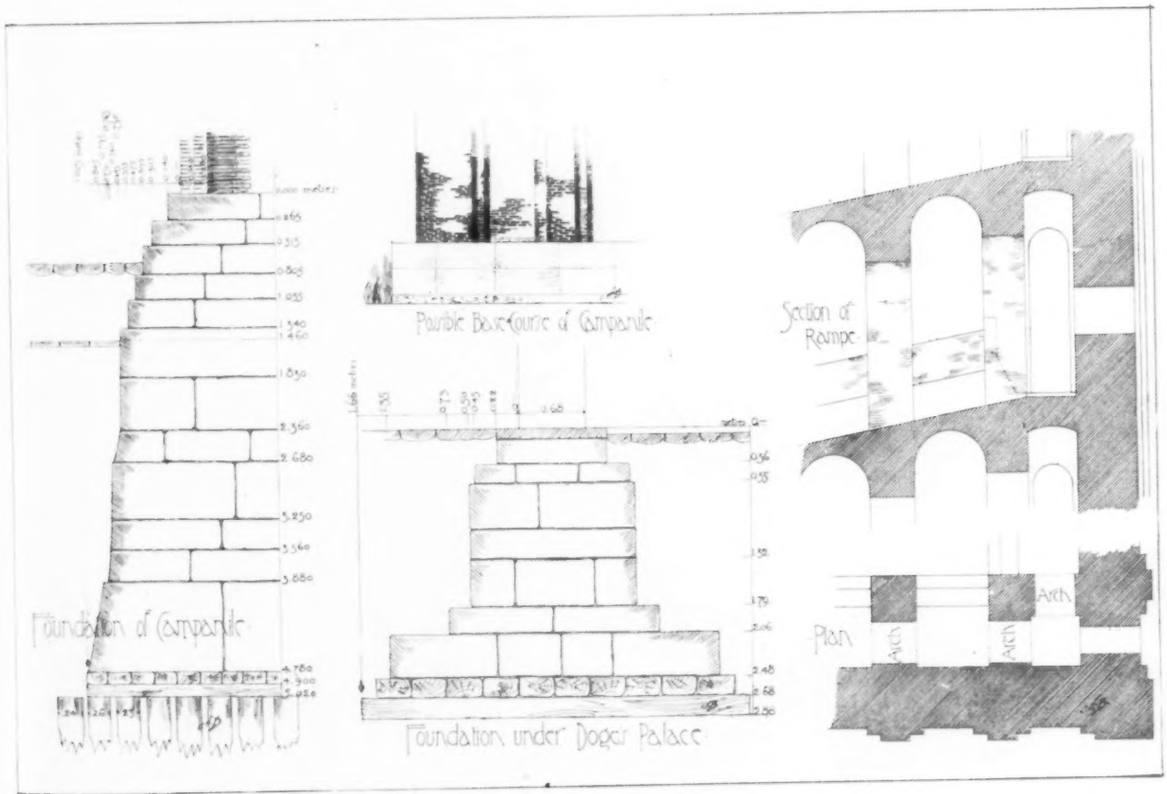


ST. PAUL'S CHURCH, BOSTON.

HELIOTYPE PRINTING CO. BOSTON.

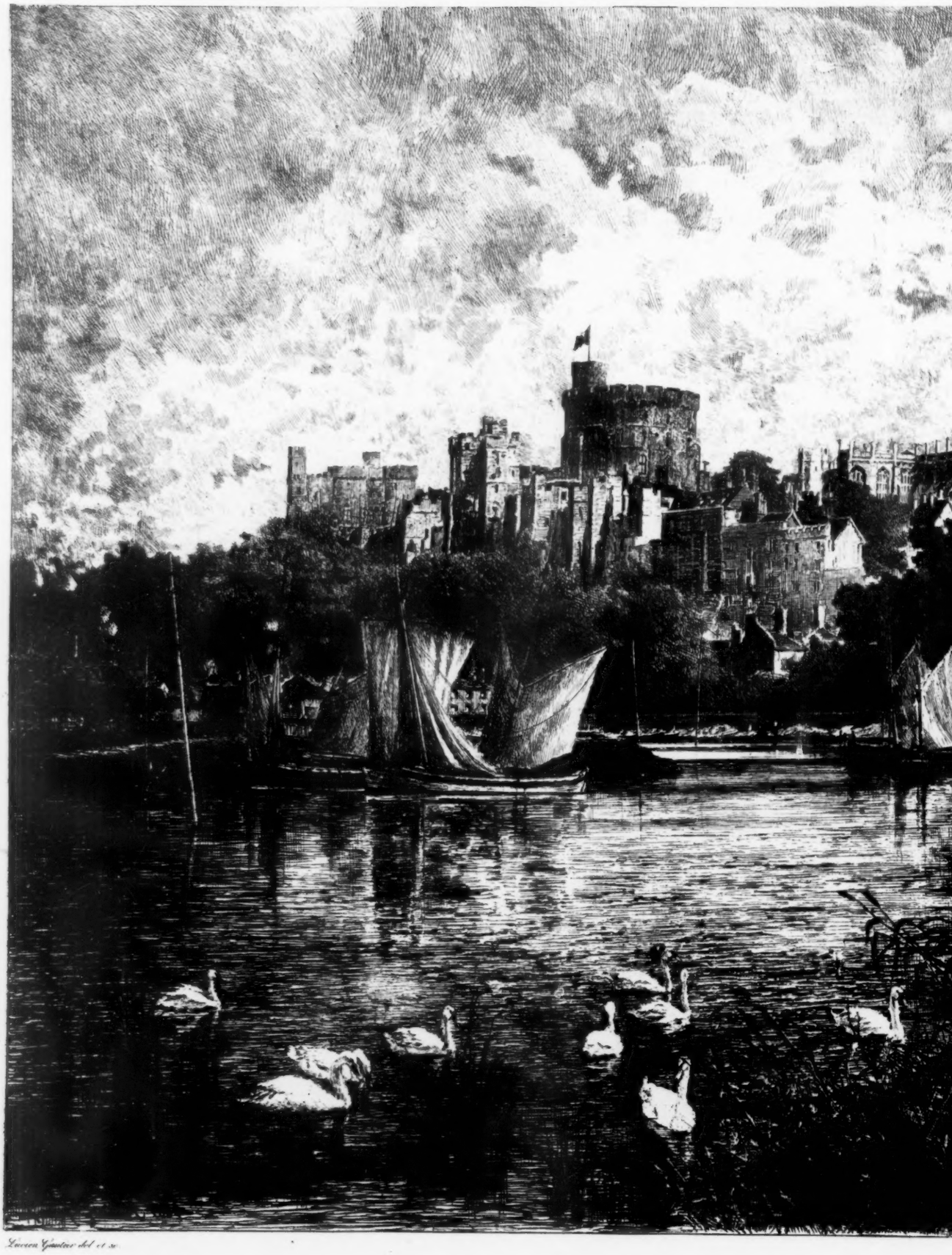
COPYRIGHTED 1885 JAMES R. OSGOOD & CO.





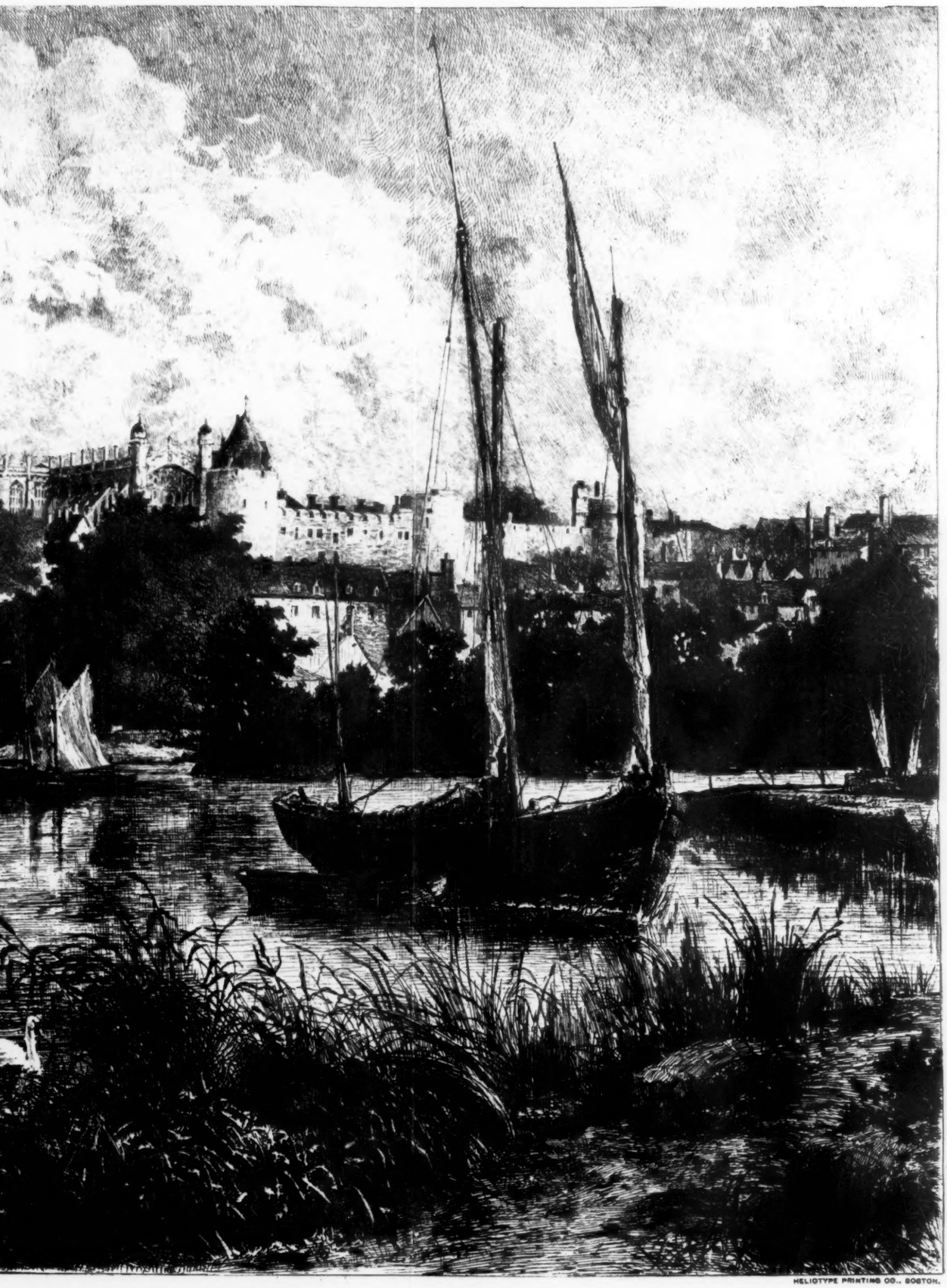
HELIOTYPE PRINTING CO., BOSTON.

COPYRIGHTED 1892 JAMES R. OSGOOD & CO.



Lucien Gautier del et sc

WINDSOR C



HELIOTYPE PRINTING CO., BOSTON.

OR CASTLE

about the same time, declares them to have been a monument erected in the reign of Aurelius Ambrosius, king of Britain, to commemorate the slaughter of Britons by Hengist; hence the name sometimes given them, "Hengist's stones," but the true etymological explanation of the name seems to be Anglo-Saxon, *stan* and *henge* from Anglo-Saxon, *hón — stone-hanging places*. This seems to prove that the stones were not set up by the Anglo-Saxons. Giraldus Cambrensis (1187) says that they were brought from Africa to Ireland by giants, and that Aurelius Ambrosius caused Merlin to transport them from Ireland to Britain. Inigo Jones broached the theory that it was a Roman temple dedicated to Cœlus, but without the slightest reason, and Mr. Fergusson maintains that they were *post*-Roman, possibly of the fifth or sixth century. Early Christian writers and councils condemned these stone circles, which is probably the reason so few exist; but that they were held in great veneration is proved by the laws of Edgar and Canute in the tenth and eleventh centuries, when they were even looked upon as places of sanctuary. Perhaps the best period to assign to them is the age of Norma, of Lohengrin, of Siegfried and of Tannhaüser. Some of the stones are twenty-five feet high, and the horizontal ones have mortise holes hewn in them which fit onto tenons upon the upright ones.

Old Sarum was a Roman stronghold, and the scene of many a fight between Saxon and Dane, and it was the birthplace of Canute. Of the old cathedral nothing remains, most of the materials having been employed in parts of the new church and other buildings of the neighborhood; but as late as 1608 the walls were still standing.

Amesbury derives its name from Aurelius Ambrosius, a king of the British in the sixth century. "The choir or sanctuary of Ambrosius was probably *the* monastery of Britain, the centre from which flowed the blessings of Christianity and civilization."—*Guest.*

Amesbury, is of interest in legendary history, as being the place of Queen Guinevere's retirement:

> . . . . . "but she to Almesbury
> Fled all night long by glimmering waste and weald,
> And heard the spirits of the waste and weald
> Moan as she fled, or thought she heard them moan;
> And in herself she moan'd 'too late, too late!'
> . . . . . they took her to themselves; and she
> Still hoping, fearing, 'Is it yet too late?'
> Dwelt with them, till in time their abbess died.
> Then she, for her good deeds and her pure life,
> And for the power of ministration in her,
> And likewise for the high rank she had borne,
> Was chosen abbess, there, an abbess, lived
> For three brief years, and there, an abbess, past
> To where beyond these voices there is peace."— *Tennyson.*

A Benedictine monastery was founded here in 980, by Queen Elfrida, to expiate the murder of her step-son, Edward, at Corfe Castle, but the discipline of the house having degenerated in 1177, Henry II expelled the nuns and made over the convent to the Abbey of Fontevrault, in Anjou (France) whence it received a prioress and twenty-four nuns. It then became a favorite resort of titled ladies. At the dissolution it passed into the hands of the Protector Somerset, and subsequently it belonged to the families of Ailesbury, Fovle, and Queensbury — old Matthew Pryor's

> "Kitty, beautiful and young,
> And wild as colt untam'd"

lived here, and here Gay wrote his "Beggar's Opera." In his correspondence with Swift, many allusions to it occur. The house was built from Inigo Jones's, or his son-in-law Webb's, designs.

On the road to Wilton, the tourist should stop at Bemerton, George Herbert's home, described by Isaac Walton as the "good and more pleasant than healthful parsonage." Herbert came to live here, upon his marriage, which was arranged and carried out in rather an odd manner. The poet had become acquainted with a certain Charles Danvers who had nine daughters, and a great intimacy growing up between them, Danvers became very anxious that Herbert should marry his daughter Jane. Not having met, they seem to have grown into fast friends and lovers by proxy and through Jane's father, and finally, three days after the first personal introduction, they were married! Herbert then gave up his public oratorship at Cambridge, took priest's orders, and settled at Bemerton. Although to us nineteenth-century Christians, Herbert's sanctity and holiness sounds somewhat overstrained, it must be remembered that his was a time when various religious emotions were influencing men of thought. That the story is true of his being found prostrated on the ground, before the altar in his empty church, vowing to himself "how he would in future manage his life," there is no reason to doubt; nor are we surprised at it when we remember the enthusiasm which kindled the hearts of the Farrar family of Little Giddings, so charmingly related in "*John Inglesant.*" Nicholas Farrar was a friend of Herbert's, and was with him about a month before his death. At Little Gidding the family life was one perpetual prayer, day and night, and the holiness of their lives was so great that they became noted for it. George Herbert seems to have had similar ideas about fasts and feasts, ideas which in those lax times were remarkable, but which in our days, since the Oxford revival, have become the common practice of most church people who think and are consistent. Herbert's lines

> "Religion stands a-tip-toe in our land,
> Ready to pass to the American strand."

prove this.

The old church contains a fourteenth-century bell, some Decorated windows, and an Early English font. The new church is handsome and was erected to the memory of the poet. But it is the parsonage and gardens which are the interesting witnesses of the poet's residence.

Some two miles beyond Bemerton lies Wilton, a quaint little town, hardly more than a village in size, surrounded by fertile meadows, through which flow endless streams. It is of great antiquity, and as capital of the Anglo-Saxon kingdom of Wessex, gave its name to Wiltshire. It is now only celebrated for its carpet factory, where the best Axminsters are made. The new church erected by Sidney Herbert is an object of interest as being the only building of its style in England. It is Lombardic, having a deeply-recessed, three-porched front, and a separate campanile which is connected with the church by a sort of cloistered passage. It stands upon raised ground and is approached by a flight of steps. The iron-work enclosing the church-yard is copied from the Scaliger tombs at Verona; indeed, all the details are taken from one or another celebrated Italian church. Thus, the columns of the central doorway are twisted, and supported upon the backs of lions, after the manner of those of the Veronese churches. The interior is composed of a nave and two aisles, the former terminating in an apse, with seats for the clergy behind the altar, which stands away from the wall, basilica fashion. The chancel shafts are black marble from Porto Venere, near Spezia, and some of the twisted columns of mosaic-work (*opus Græcanicum*) were formerly in the church of Sta. Maria Maggiore in Rome. The shafts of the nave are stone, and the plain walls above are absurdly ornamented with a sort of sham triforium. Were these niches filled up and the walls covered with frescoes, the effect would be good; as it is, it is bald and poor in the extreme. The pulpit is exceedingly handsome; it is of stone, supported upon sixteen black marble columns with alabaster capitals, the upper part being ornamented with twisted mosaic columns and panels of inlaid marbles. The church contains some good old glass of the thirteenth century, and the two tombs of Sidney Herbert and of his mother, the Countess of Pembroke, are very good specimens of modern work of its kind; but placed as they are on each side of the chancel, they occupy the space which ought to be filled by stalls for the clergy and choir. The whole arrangement of the chancel end of the church is wrong.

But at Wilton it is the house which claims the visitor's attention the most. It occupies the site of the great monastery, founded, it is said, by Alfred the Great, but really by Wulstan, Earl of the Wilsætas; it seems to have been in early times a favorite resort for pseudo-royalties. There is a curious letter extant from Henry VIII to Cardinal Wolsey and Anne Bullen, who had a favorite of proven low manner of life, whom she wished to make abbess. "I wolde not," writes the king, "for all the gold in the world clog your conscience nor mine, to make her a ruler of a house which is of so ungodly a demeanor, nor I trust you would not that neither for brother or sister I should so distain mine honour or conscience." Poor king's conscience, it was not so tender in later years!

The abbesses of Wilton were baronesses of England, an honor shared only by those of Shaftesbury, Barking, and St. Mary's, Winton. Henry VIII gave the land and house to Sir William Herbert, first Earl of Pembroke. It abounds in associations. "Charles I." says Aubrey, "did love Wilton above all places, and came here every summer. By his advice the garden front of the house was built in the Italian style." Shakespeare and his troop are said to have played here in 1603, before King James I, Ben Jonson, Inigo Jones, and Vandyke. Here Sir Philip Sydney wrote part of his "*Arcadia*," and surely never was place nearer resembling that classic land. Round the house are lovely gardens filled with every kind of flower, and with a background of wooded park, full of deer; every sort of tree is to be seen, from the splendid cedars on the lawn, to the firs, beeches and elms of the upper park. The Italian garden, the Palladian bridge, the statues dotted about, the arched arcades, and the distant view of the cathedral, make up, with the exquisite flowers and the clear running stream, as earthly a paradise of its kind as can be seen anywhere. The house contains some handsome rooms and fine pictures, amongst others some justly-celebrated Vandykes. The largest of these is a family portrait, skilfully arranged and glowing with color. The elegance of the costumes is truly Vandyke, as is the rich color and the beauty of the hands. One is tempted to ask, "did all the people in those days have beautifully formed hands, or did the painter systematically idealize them?" This picture contains ten figures, and occupies one end of a very large drawing-room. There is also a portrait of Charles I in armor, one of the many replicas of the king, and a very good one; also a portrait (less good) of Henriette Marie, his wife and another of the three children, besides others of the same painter. There are some pictures by the great Italians, of inferior quality, and a few very fair ones of the Dutch and Flemish schools. But the glory of Wilton House are the numerous first-rate Vandykes. The principal gateway of the house should be noticed; it is Italian in style, or rather Roman, resembling the Arch of Titus, and has a copy in stone of the bronze equestrian statue of Marcus Aurelius on the Capitol at Rome. Round the inner courtyard of the house runs a cloister filled with antique sculptures brought from time to time from Italy: statues, bas-reliefs, busts, etc.

A longer excursion, some fifteen miles, may be made to Wardour Castle, the seat of Lord Arundel, which lies in the midst of splendid woods. Spring is the best time to visit it, as there are multitudes of

rhododendrons, which when in flower add charm to the park. The old castle, which is now but a picturesque ruin, was built by Lord Lovel in 1393, but through taking the Lancaster side during the Wars of the Roses, it passed away from that family, and ultimately came into the possession of Sir J. Arundel in 1547. During the civil wars of Charles I's reign it was the scene of a romantic episode of history. It was besieged by Sir Edward Hungerford, and Lord Arundel being absent, his wife, with some fifty persons, men and women, withstood the onslaught of fifteen hundred men and a bombardment, during six days. The Lady Blanche was, however, obliged to capitulate, but upon honorable terms, one condition being that "the women should keep all their wearing apparel." But alas for the credit of the soldiers of the commonwealth! no sooner were they in possession than they plundered the house, cut down the trees, and, not satisfied with getting 4*d.* and 6*d.* apiece for them, they tore up the leaden piping which conveyed water to the house, and sold it also. In 1643 the castle sustained another siege, by young Lord Arundel, after his father's death, and Ludlow, who held it for Cromwell, was compelled to surrender. Little remains of the old building but some Perpendicular tracery; and that is much overgrown with ivy. The entrance doorway and one which leads up a staircase are Renaissance. Close to the ruins is a very large and fine tree of the iron oak variety. The original plant was brought from America more than two hundred years ago by Cecil Calvert, Lord Baltimore, whose wife was Ann, daughter of the first Lord Arundel of Wardour. Lord Baltimore was the owner of the colony of Maryland, granted to his father, George, by charter, and it became a settlement of Roman Catholics in 1634. The house contains a few good pictures and a great deal of old Chelsea and other china, ivory carvings, and the celebrated Glastonbury cup, which dates from about 1600, and was made out of the Holy Thorn planted by St. Joseph of Arimathea, hence its name. The body of the cup, which rests upon crouching lions, is carved in relief with medallions representing the twelve Apostles; on the lid is the Crucifixion. It contains two quarts, and originally there were eight pegs on the inside, which divided the ale into equal quantities of half a pint each. The ornamentation of the rotunda staircase, a peristyle of fluted Corinthian columns supporting a cupola, is very refined and elegant. The chapel is in the same style, and is only remarkable for the richness of its altar and silver lamps. It is composed of a verd-antique sarcophagus, surmounted by a slab of porphyry and agate; the columns of the tabernacle are of jasper, and the crucifix is solid silver. In the vestry are some fine vestments, notably the Westminster chasuble, of rich red velvet embroidered with the Tudor rose, the *fleur-de-lys*, and the portcullis and pomegranate; it was made for the coronation of Henry VII.

On the road to Longford Castle the visitor may visit Clarendon, the seat of the famous "Constitutions of Clarendon," by which King Henry II, in 1164, alarmed by the assumptions of Becket and the ecclesiastics, sought to settle the disputes, and "to establish thus, with the consent of the whole nation, an English Constitution in Church and State." (*Milman*). Clarendon was the favorite resort of monarchy from the reign of Henry I to that of Edward III. At a later period, in 1356, Philip of Navarre did homage there to Edward III, as King of France and Duke of Normandy; and in 1357, after the battle of Poictiers, the woods were enlivened by much hunting, in which the captive kings of France and Scotland, John and David, rode side by side with Edward to the chase. It was later on mortgaged by Charles I to Chancellor Hyde, who took his title from it; but Charles II unexpectedly paying it off, it was bestowed upon George Monk, Duke of Albemarle.

Longford Castle was built as early as 1591, by Sir Thomas Gorges, whose tomb we noticed in Salisbury Cathedral. The expense was so great driving piles for a foundation into the marshy ground, that he was well-nigh ruined; but being appointed governor of Hurst Castle, he had the luck to see a galleon of the Spanish armada wrecked close to the castle, and to possess himself of some of the treasure, with which he completed his castle. During the civil wars it surrendered to Cromwell, and since then it has been almost entirely rebuilt. Its chief interest is its picture-gallery, which contains some undoubted Holbeins and Velasquez, besides works of other old masters. The portrait of Admiral Adrian Pulido Pareja is alone worth a pilgrimage to Wiltshire, and is one of the finest of Velasquez's works in England. By Holbein are the portraits of Erasmus and Ægidius; by Claude Lorraine, two fine landscapes typifying "Morning" and "Evening," by the landing of Æneas in the Bay of Naples, and the ruins of the Arch of Titus and the Coliseum; by Rubens, a fine landscape of the barren country around the Escurial, but said to be a replica of the one at Petworth. Holbein's "Ambassadors" is curious for the wonderful realism of the painting of the accessories: astronomical and musical instruments, books, and a wondrous foreshortened stuffed fish.

Stratford, near Salisbury in the opposite direction, was the birthplace of William Pitt, Earl of Chatham, probably the real founder, indirectly, of American independence. S. Beale.

Funeral Architecture in Paris. — The most remarkable demand, if it be not a guy, is that made by *l'Evénement*, of Paris, for a reform in the architecture of the morgue, which it now declares is ridiculous and gloomy, and it goes on: — It has nothing Parisian about it, it wants gayety, and is generally unworthy of a city where cemeteries are gardens, funerals festivals, criminal courts places of public entertainment, executions spectacles, and a siege an excuse for a carnival.

BOOKS.

Carved Wood Capital. French. 12th Cen.

The publishing of books of the "*Family Doctor*" type and the manufacture of patent cure-all medicines do not seem to be very seriously prejudicial to the growth and welfare of the medical profession, so there is probably no reason why architects should regard with other than a languid interest the publication of books whose ostensible object is to enable the public to build its own houses, and save to itself that precious five per cent whose salvation is so clearly desirable in the eyes of a great proportion of those who think of building. We look on such works as beneficial, rather than hurtful to the welfare of the profession, as, though they do often enable a man to "build his own house," they more often serve as educators, stimulating inquiry and suggesting doubts and possibilities for whose solution trained assistance is needed, which may be sought at the hand of him who compiled the book, and so bring fruition to the purpose of its publication, or at the hand of some practitioner nearer at hand.

More and more of these books of designs for the less costly kind of dwellings are published every year, each succeeding one improving on its predecessors in some particular, either in merit of design, presentation of the subject or freshness of fashion. In this last particular they are rather interesting, as they show how the latest craze in architectural fashion can be adapted to buildings of various sizes and prices by a designer of some individuality and force, for it takes both of these qualities to conceive and carry into execution such a publication.

Not the least meritorious of these collections is contained in the portfolio before[1] us, which holds a score or so of designs, most of them conceived in what is spoken of by the unprofessional American as the "Queen Anne style," that is, designs which depart from the vernacular in that they are emphasized by scroll-work panels, pedimented window-heads, small-lighted windows, barge-boards, false half-timber work, overhanging gables, marvellously-shaped brackets and piazza posts, and windows of all sorts, shapes and sizes, in ordinary and untoward positions, most of these things wrought in wood and all suggesting to those knowing in such matters the question of repairs. This collection lacks the interest belonging to some others in that it is the work of one hand, albeit a hand sufficiently skilled and well-trained both in design and in draughtsmanship. Still it is very worthy of attention and worth having done as a contribution to the bettering of the homes of our American middle classes, monetarily speaking, for most of the cottages are intended for those who have only a few thousands to spend on a home.

The plates show only the perspective and two floor plans, and for description a simple statement of the supposed cost in round numbers, which in the case of the cheaper houses should certainly be increased by a third or a half. In fact, of these smaller cottages that shown in Plate III seems the only one that could by any possibility be built for the price named, $1,500, and in point of design—the fulfillment of the designer's purpose — it is one of the best. In almost all the others the initial fault lies in the plan, whose eccentric contour — each room insisting on poking an elbow or an eye out beyond its neighbor — is the cause of consequent gambols of the roofs, which play leap-frog with one another while the vertical angles are playing hide-and-seek for the amusement of an overhanging audience of balconies, bay-windows, gables and dormers. This irregularity of outline, which may be taken as typical of the plan of an American house, often results in a more enjoyable and convenient interior than those more formal ones adopted in other countries, but it more certainly leads to a very large increase in the cost, not in the item of material only, but in that of labor. What architect has not impatiently watched the time spent by a careful workman in finishing around some unusual feature which he had introduced to give interest or character, or to distinguish the building from its neighbors, and has not asked himself with sudden misgiving whether after all this particular game was worth the candle? If this collection of designs is put forward to show the author's prowess in designing houses of differing prices, a species of advertisement as it were, or an invitation to him who intends to build to bring his job to the author to carry out, it is arranged with good judgment; but if, as such collections sometimes are, it is intended as a simple book publication, in which the author's only interest lies in the profit from its sale, and if it is intended to supply the wants of those who wish to build without the aid of an architect, the author has, we think, blundered in making his designs so complicated in both plan and elevation. With few exceptions the designs could be vastly improved, and the actual cost of construction be made to more nearly approximate the prices given if they were rigidly simplified.

It is quite useless for any young man to think he can ever become an architect in the fullest sense of the term, if he be a victim of that peculiar mental deficiency which compels him to confess, in spite of every effort, that the science of numbers is to him a sealed book.

[1] *The Portfolio of Cottages.* By J. H. Kirby, Architect, Syracuse, N. Y.

The natural inaptitude for mathematics is, we believe, almost impossible to overcome, quite impossible if the victim approaches his tedious task with the slightest doubt of his ultimate success. Still it is necessary that all architects, even those who propose to associate themselves with or employ competent mathematicians, should have an elementary knowledge of the science as it is applicable to the mechanics of building, and any book that can present this information in simple and comprehensible form is a welcome contribution from the expert to the inexpert. Such a book appears to be the one[1] before us, which, though it is avowedly a text-book prepared for school and college use, is one which can be considered as a work on mechanics of direct bearing on practical affairs quite as much as a text-book dealing with theoretical problems. It is a pleasant book, too; admirably manufactured, so that it invites rather than repels the inquirer, while the explanations are given without unnecessary waste of words and yet are happily wanting in that forbidding dryness common to books of its class; in short, we will venture to give the rather ambiguous description of it that it is perhaps the most unmathematical mathematical book we have ever seen. As to its use to the profession, it seems to be an admirable preparation for the study of the larger and more comprehensive works of Professor Thurston on the "*Materials of Engineering*," or of Professor Lanza on the "*Applied Mechanics and Resistance of Materials*," issued by the same publishers.

As we have a somewhat strong personal belief that one learns more from his failures than from his successes, our feeling that the editor of the *Sanitary Engineer* had an unusually "happy thought" when he conceived of publishing in book-form the answers that have been given in his journal since its foundation, to questions of theory and practice submitted to him, may be more emphatic than the performance really justifies. In this case, however, it is by the failures of others that we are to be enlightened, and we are at liberty to hug ourselves in pharasaical delusion that under the same circumstances we would not have been such fools as the questioners.

The *Sanitary Engineer* has always made a good deal of this department of question and answer, and as it had the good fortune to deal with a science which was just beginning to obtain public notice, it has had an unusual number of questions put to it which cover a wide range of practical matters, and we feel certain that a greater number of readers have followed the exposition of the difficulty, and the solution suggested than usually study the corresponding departments of other journals. They had, too, the satisfaction of knowing that the answers given were not necessarily prepared by the editor himself, but that the questions had been submitted to one or more experts, who either wrote the replies, or gave the editor the necessary points.

Taking the book[2] as it stands, without comparing it with the files of the journal, we should say that the editing had been confined entirely to the selection and arrangement of the material: The answers do not appear to have been rewritten or amplified as they might very well have been, since most of them bear the mark of the conciseness which is compelled by the limited space available in a journal; this is particularly noticeable in some cases where several questions are asked, while only one is answered. Of course many answers which appeared ingenious and satisfactory at the time have been omitted as the advance made in the knowledge of sanitary laws has shown that they were founded on false premises, so that what is given may be accepted as the replies which the editor would give to the same questions if they should be propounded to-day.

The book is excellently got up and printed, and the cuts, of which there are one hundred and forty-six, appear to better advantage than in the journal, while its contents are made readily accessible by a fairly good index. It would be a great improvement, however, if the titles of the several questions had been more judiciously worded: for example, "To prevent Rust in a Suction-Pipe" states neither the point which the questioner raises nor is it considered in the answer. In running over the index we are surprised to find that the working of pumps, concerning which many questions must have been asked, is almost wholly neglected. In like manner we find no notice taken of the perhaps most common question of all: How far from a leaching cesspool must a well be put to ensure safety? But where it is a matter of doubt concerning the connection of pipes and traps, the management of drains, the circulation of hot-water, and many of the inexplicable difficulties which the householder encounters this book may be consulted with a fair chance that some other unfortunate has had a similar ailment cured. The value of the book to the architect is considerably enhanced by the publication in an appendix of the plumbing laws of New York, Brooklyn and Boston.

FOR another useful publication, architects will have to thank another editor, this time the editor of *Carpentry and Building*, who in collaboration with an architect has done his best to prevent the perpetuation of those extraordinary differences in the amounts of the tenders made by equally honest and efficient builders for the same work. The vagaries of the skin-builder and the men of straw it is not worth while to consider, as their bids are generally thrown out, or when accepted it is with eyes open by an architect or owner who pits his shrewdness against theirs, or by a board dealing with public funds: in the first case no one cares which party gets bitten, and in the second it is every one's business, and therefore no one attends to it.

The particular way in which these gentlemen propose to remove or palliate the evil is through the use by the bidders of printed blank schedules,[3] which they can fill up as they figure-out their quantities and make their computations on the separate items of the work they propose to execute, and by so making use of them they make reasonably sure that no portion of the work that architect and lawyer can prove was to be part of the work contracted for by them has been overlooked. These blanks, of course, are kept by the bidder, and are not sent in as the tender itself: they are a superior kind of *aide memoire* which have a value apart from the assistance they give on the job in hand; for, preserved by the bidder, they will form a most valuable reference list which will be found of great service, even if, after having used them for a reasonable time, the builder prefers to return to the old guess-work method of preparing his bid, since instead of saying to himself: "Well, I built just such a house for So-and-so, and it cost so much, my profit was satisfactory, but as prices have gone up ten per cent, I must add ten per cent to the bid I made then," he can refer to the schedule he prepared on that job, and make sure that he is not mixing it up with some other one.

It seems to us that these blanks are likely to be so serviceable that we do not hesitate to suggest that instead of waiting for the builders to learn that there are such labor-saving appliances, and slowly educate themselves into the habit of using them, the architects should take up the matter, and keep a supply of the blanks on hand to be given to every builder who wishes to prepare a bid. In such case it would be possible for the architect to fill up one of the schedules, and so be better able to check-off the bids made, and select the most satisfactory: or he might fill up one in the gross particulars, and use it as a bill-of-quantities which the bidders could copy, and thus be saved considerable time. The specially good points about the blanks are (1) a memorandum of the "data upon which this estimate is based," which includes a list of the drawings, the specifications and the verbal explanations; (2) a copy of the proposal made; (3) a record of the bids of all the competitors; (4) a *duplicate* schedule of timber which can be torn out and sent to the lumber yard as an order: this will certainly help make sure that each piece of timber is received as ordered, and that no piece shall be used for any other part of the work than that for which it was specially required. The bulk of the space is apportioned under the several appropriate headings: excavation, foundation, framing, floors, roofs, doors, windows, etc., so arranged that the cost of each step or feature can be footed-up by itself, a line for "allowance and profit" being assigned to each, and enough blank lines for use in case anything has been overlooked by the compiler or the building have unusual features.

As yet only blanks for an ordinary house have been prepared, but we believe that if they meet with acceptance, blanks adapted to other classes of buildings will be issued. Besides the blanks is a little hand-book giving the necessary explanations and lists of all the work and materials required in building, which if it serve no other use will prevent an architect from forgetting to mention them in preparing a specification.

Of course certain imperfections are to be expected and easily discovered, but it is surprising to find that under "plumbing," the only pipe mentioned is the "soil-pipe," and it is almost as surprising to find that no one is expected to heat his house by steam or hot-water. Still the blanks seem good enough to use, and we think that architects who like thorough work will give them a trial.

NOTES AND CLIPPINGS.

A PAUPER BULWARK FOR GREAT BRITAIN.—The world has changed since Swift's day, and a certain class of humor in which he excelled is not appreciated now. Mr. Pratt, of Covent Garden, has not kept up with the times. All survivals of a past epoch are interesting to the philosopher, and a "long printed document," which this gentleman addressed to the Strand Board of Guardians should be peculiarly attractive to them; but less contemplative souls will not see the jest, probably. Mr. Pratt urges that all deceased paupers should be sent to Herne Bay for interment. A railroad might be built for the purpose. The body, enclosed in a cheap coffin, should be buried in the soft sand of the beach, at a considerable depth, and round it should be neatly laid a bedding of concrete. This material would harden, of course, and other corpses, similarly treated, ought to be placed upon the top, so that in no long time a solid wall of dead paupers, each protected by his covering of concrete, would effectually stop any further encroachments of the sea. Thus in death certain classes of the population might be turned to account, who have, unhappily, failed to do the State service in their lifetime. The Strand Board of Guardians is composed, as it should be, of robust and practical men. They declined, amidst roars of laughter, to debate this proposal, but it may be feared that they did not catch the spirit of it as our ancestors would have done. They made merry, not so much with the fun of the idea as with Mr. Pratt. He will not win fame as a humorist. His suggestion for disposing of dead paupers will not be quoted in all future time as a master stroke of drollery. He was born an age too late. — *London Standard.*

[1] "*A Text-Book on the Mechanics of Materials and of Beams, Columns and Shafts.*" By Mansfield Merriam, Professor of Civil Engineering at Lehigh University. New York: John Wiley & Sons, 1885.

[2] "*Plumbing Problems:*" or Questions, Answers and Descriptions relating to House-Drainage and Plumbing, from the *Sanitary Engineer*, with 146 Illustrations. New York: *The Sanitary Engineer*, 1885.

[3] "*Handy Estimate Blanks*," and the "*Practical Estimator*," being a companion and key to the "*Handy Estimate Blanks*;" containing directions for preparing builders' estimates, together with numerous tables and rules useful in such work. Also a list of all the items ordinarily entering into a building, so arranged as to be a convenient and systematic reminder of the items to be listed. By J. D. Sibley, architect and builder, and A. O. Kittredge, editor of *Carpentry and Building*. New York: David Williams, 83 Reade St., 1885.

The Floor Area of the Philadelphia Post-Office. — The Philadelphia *Call* gives the following measurements of the New Post-Office floor-space: —

Basement, Post-Office	67,000 sq. feet
First floor	67,000 sq. feet
Second floor, Assistant Treasurer.	58,000 sq. feet
Third floor, U. S. Courts	58,000 sq. feet
Fourth floor, various offices	51,500 sq. feet
Attic, storage	58,000 sq. feet
Total, 8¼ acres	359,500 sq. feet

Making Lead Sheets by Hydraulic Pressure. — By a German patent, dated May 24, 1884, we see that J. Brandt, of Berlin, proposes to make sheet-lead by hydraulic pressure, in a manner similar to that in use for making lead pipe, instead of by the present method of working down a large block of lead to the required thickness by means of rolls. The receiver for the lead is made of such a length as may be required for the greatest width of sheet which it is proposed to make. The bottom of the receiver is connected to the pistons of several hydraulic rams, and slides up and down in the receiver. A part of the top of the receiver consists of movable jaws, whose distance apart can be nicely regulated by rack-and-pinion arrangement. These jaws being opened sufficiently wide, a charge of molten lead is run into the receiver, and then the jaws are closed to an opening corresponding to the thickness of sheet required. When the lead has cooled to the point which experience shows to be most suitable, the hydraulic pressure commences, and the lead is slowly squeezed out in the form of a sheet. — *Engineering.*

Excavations at Olympia. — The excavations at Olympia are to be recommenced immediately under the auspices of the Archæological Society of Athens. On these excavations the German Government has expended so far a million marks, £20,000 more than is generally supposed, the sums voted by the Reichstag and granted by the Emperor having been supplemented at a later date by a large bequest from an unknown quarter in Berlin. It is declared by those best qualified to judge, that two-thirds of the site of Olympia still remain to be excavated. The Germans themselves, however, seem to be glad to have done with the work, as they have cleared out the principal parts where the richest harvest of *trouvailles* was expected, while nationally they have derived very little profit from the undertaking. They think they made a great mistake in stipulating only for duplicates of what they found, as of course no important objects existed in duplicate. They fancy that nothing of any great artistic value can now be found in the vast area of the Stadium or in the other outlying structures; but the Greek society has determined to clear away the vast mass of superincumbent earth, and to bring back the whole site to the original level, so that the lines of ancient Olympia may be clearly discerned. The local museum, the gift of a patriotic Greek gentleman, is a large building now roofed over, and is being plastered. In a few months it will be ready for the reception of the statues and bronzes already found.—*Athenæum.*

Mount Kearsarge Railroad. — Mount Kearsarge, one of the lesser of the White Mountain range in the State of New Hampshire, U. S., has for many years been a noted resort for lovers of mountains on account of the diversified beauty of the scenery viewed from the summit. Although only 3251 feet in altitude, many travellers prefer it to other of the White Mountains reaching to twice the height; in its outline from some positions it reminds one of Mount Vesuvius. Hitherto it has been scaled by a bridle-path somewhat too steep and slippery on the ledges for horses to be used with perfect safety, reaching nearly to the summit. The construction of a mountain railroad has been commenced. Instead of using the rack-and-pinion system adopted on Mount Washington Railway and elsewhere, or an inclined railway where cars are drawn by ropes pulled by stationary engines, they are to use an ordinary traction railroad of two feet gauge, and by laying it out in the form of a volute, the maximum grade is 265 feet to the mile, and the length of the road will be eleven and one-half miles, or about five times that of the bridle-path. By continually encircling the mountain, a variety of landscape views will be obtained from the trains. Some of the curves are necessarily sharp, the highest curvature being thirty degrees. — *Engineering.*

Removing Microbes from Water. — Professor Frankland has recently made a series of experiments on the relative efficiency of filteration, agitation with solid particles, and precipitation as a means of removing micro-organisms from water. His method was to determine the number of organisms present in a given volume of the water, before and after filtration. The filtrating materials were green-sand, silver-sand, powdered glass, brick-dust, coke, animal charcoal and spongy-iron. These materials were all used in the same state of division, being made to pass through a seive of forty meshes to the inch. Columns six inches in height were used. It was found that only green-sand, coke, animal charcoal, and spongy-iron, wholly removed the micro-organisms from the water filtered through them, and that this power was lost in every case, after the filters had been in operation a month. With the exception of the animal charcoal, however, all these substances even after being in operation for a month, continued to remove a very considerable proportion of the organisms present in the unfiltered water; and in this respect coke and spongy-iron occupied the first place. Water containing micro-organisms was also agitated with various substances in the same state of division as above mentioned, and after subsidence of the suspended particles the number of organisms remaining was determined. A gramme of substance was in general agitated with fifty c.c. of water for a period of about fifteen minutes. It was found that a great reduction in the number of organisms could be produced in this way; and the complete removal of all organisms by agitation with coke is especially to be remarked. Precipitation by "Clark's process" also showed that it affords a means of greatly reducing the number of these organisms in water. Dr. Frankland concludes from his experiments that although the production in large quantities of sterilized potable water is a matter of great difficulty, involving the continual renewal of filtering materials, there are numerous and simple methods of treatment which secure a large reduction in the number of organisms present in water. — *Exchange.*

The London Tower. — In the future, it would seem, the Tower is to be, even more than in the past, one of "the sights o' London." It is to be divested entirely of its utilitarian chapter. The rifles in the Armory are to remain, but the whole of the large store of arms is to be removed to the central depot at Weedon. This, we are told, is in fulfilment of a desire that the Prince Consort had very much at heart — a desire that the Tower should be preserved wholly and simply as a building remarkable for its architecture and for its historical associations. In accordance with this view, the barrack and hospital stores were removed in 1869, and the accoutrements a few years after. The workmen, of course, went also, and now the building will be deserted, so far as permanent tenants are concerned, by all save the small garrison which has always been maintained there. The arrangement will probably meet with general approval. It is, perhaps, as well to separate in this case the practical and the sentimental elements. The maintenance of the useful functions of the Tower means, of necessity, wear and tear, to which it is, no doubt, desirable that the building should no longer be subjected. There is very much to be said for keeping such famous old places as the Tower in as perfect a state of preservation as possible. We can find plenty of localities for the storage of arms, but we cannot adequately repair any damage which may be done to our ancient historical landmarks. We can "restore" them in one sense, but not in another. — *London Globe.*

The First Railroad in America. — In the course of a paper read before the Franklin Institute, bearing the title "Transportation Facilities of the Past and Present," Mr. Barnet Le Van corrects the commonly received statement that the Granite Railroad, built at Quincy, Mass., in 1827, by Gridley Byrant, for transporting stone for the Bunker Hill Monument from the granite quarries of Quincy, was the first railroad built in the United States. On this point he presents interesting testimony to prove that, far from being the first, the Granite Railroad was really only the fourth in order of precedence in the United States. We quote from that portion of the paper relating to the subject, with the simple comment that the statements made by the author are of considerable importance from the standpoint of historic accuracy: "Railroads were also first introduced in Pennsylvania. In September, 1809, the first experimental track in the United States was laid out by John Thompson (the father of John Edgar Thomson, who was afterward the president of the Pennsylvania Railroad Company), civil engineer, of Delaware County, Pa., and constructed under his direction, by Somerville, a Scotch millwright for Thomas Leiper, of Philadelphia. It was sixty yards (one hundred and eighty feet) in length, and graded one-and-one-half inches to the yard. The guage was four feet and the sleepers eight feet apart. The experiment with a loaded car was so successful that Leiper in the same year caused the first practical railroad in the United States to be constructed for the transportation of stone from his quarries on Crum Creek to his landing on Ridley Creek, in Delaware County, Pa., a distance of about one mile. It continued in use for nineteen years. Some of the original foundations, consisting of rock in which holes were drilled, and afterward plugged with wood to receive the spikes for holding the sleepers in place may be seen to this day."

The Purification of the Thames. — Our readers will remember that from time to time we have published accounts of the evidence received and the conclusions arrived at, by the Royal Commission, which was appointed to inquire into the state of the Thames. It was found that last summer the condition of the water reached a pitch of foulness at which the nuisance became unbearable, and the whole riverside population from Greenwich to Erith was more or less inconvenienced by the stink. Those who had to gain their living on the water suffered actual sickness, while the Commissioners themselves were attacked by diarrhœa and vomiting after one of their visits. The state of affairs grew so bad that the Metropolitan Board of Works were obliged to confess that their crowning work was a failure, and sought to whitewash its filth by a plentiful admixture of chloride of lime, which was used to the extent of very many tons a day. All that time the advent of cholera in this country was expected almost day by day, and the calm assurance with which the danger would have been met, owing to the otherwise capital sanitary arrangement of the metropolis, was a good deal shaken by the uncertainty as to what effect the floating mass of filth, regurgitating daily between Blackwall and Erith, might have on the question. It was too late to do anything last summer, but every one felt that at length the time had come when this crying disgrace would be attacked. But we are again at the end of July and the authorities have made no sign, and to all appearance have forgotten that the Commission ever sat. But while officialism has been dozing or sulking, private enterprise has been at work. Mr. Bailey Denton and Lieutenant-Colonel Alfred S. Jones have acquired more than three-fourths of Canvey Island, a large area of 4000 acres reclaimed from the Thames, and separated from the Essex Marshes by Hole Haven and East Haven Creeks. Here they propose to erect purification works, using the solid matter to raise the ground up to high-water mark or higher, and turning out a pure effluent clarified by filteration through the land. They estimate that there is space to bestow the solid sewage matter for 100 years, and much additional ground could be obtained by reclamation if needed. Added to the scheme is an offer to take the sewage from the Metropolitan Board, and deal with it satisfactorily for an annual subsidy of £110,000, or one penny in the pound of the metropolitan rates. At the end of forty years the whole plant and land is to be handed over to the authorities without further payment. This proposal has been submitted to the Home Secretary, and bears on its face the stamp of earnestness and good faith, which should secure it a fair consideration. — *Engineering.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

323,898. WINDOW-SCREEN.—William G. Anderson, Boston, Mass.

323,909. BRICK-MACHINE.—Walfrid Burkman, Chicago, Ill.

323,911. WASH-BASIN, ETC. — William J. Cahill, Lenox, Mass.

323,919. ELEVATOR.—Levi Daso, Montpelier, O.

323,921. ANNUNCIATOR. — Charles E. Dey, Denver, Col.

323,924. FIRE-ESCAPE. — Wilhelm A. Evers, Edgewood, Ga.

323,930. CONSTRUCTION OF FIRE-PROOF BUILDINGS.—Rafael Guastavino, New York, N. Y.

323,945. CHIMNEY-TOP.—Davis L. McCahan, Baltimore, Md.

323,989. BIT-STOCK. — William S. Washburn, East Bridgewater, Mass.

323,991. DEVICE FOR HANGING WALL-PAPER. — Albert Wilcox and Eliza B. Wilcox, Maple Rapids, Mich.

323,998. SASH-FASTENER. — John I. Barinuger, Waterford, N. Y.

324,011. CLAPBOARD-GUAGE. — Jehiel W. Danly, Attica, N. Y.

324,019. ELECTRICAL ALARM FOR WINDOW-SCREENS.—Henry Garrett, Dallas, Tex.

324,043. APPARATUS FOR MOISTENING THE AIR IN COTTON MILLS, ETC.—Mortimer Sherman, Lowell, Mass.

324,074. HEATING-STOVE. — Marinus Jan Schuurbeque Boeye, Zwolle, Overyssel, Netherlands.

324,077. WINDOW-SCREEN AND VENTILATOR. — John G. Bronson, Chicago, Ill.

324,078. MECHANICAL BOARD-MEASURE CALCULATOR.—Robert H. Bulloch, Savannah, Ga.

324,100. BORING-MACHINE.—John Ernst, Bay City, Mich.

324,106. HEATING AND VENTILATING APPARATUS. —John L. Hamilton, St. Joseph, Mo.

324,121. SCREW-DRIVER. — George F. Kolb, Philadelphia, Pa.

324,144. SAFETY-BRAKE FOR ELEVATORS. — John W. Metz, Manchester, O.

324,147. WATER-COLOR. — Charles F. Nicholson, Rochester, N. Y.

324,149. SHUTTER-WORKER.—Harden Palmer, Everett, Mass.

324,170. TRANSOM-LIFTER. — George H. Sargent, New York, N. Y.

324,172. WATER-CLOSET. — Rockwell Sayer, Chicago, Ill.

324,200. MANUFACTURE OF WHITE LEAD. — Wm. H. Wetherell, Philadelphia, Pa.

324,213. EAVES-TROUGH HANGER. — William H. Berger, Philadelphia, Pa.

324,230. MIXED PAINT. — George T. Clare, Jersey City, N. J.

324,236. MIXED PAINT.—Robert W. Davis, Elmira, N. Y.

324,239. HOT-AIR FURNACE. — Hosea B. Dewey, Milwaukee, Wis.

324,252. SASH-HOLDER. — Abel Haskins, Chicopee, Mass.

324,271. VENTILATOR. — William H. Payne, Camden, N. J.

324,278. REFRIGERATING APPARATUS FOR HOUSES.—Johann and Jacob Stuber, Syracuse, N. Y.

324,293. BATH. — George Booth, Toronto, Ontario, Can.

324,323. COMBINED TRY-SQUARE AND BEVEL. — Leonard D. Howard, St. Johnsbury, Vt.

324,337. HOT-AIR FIREPLACE. — James Philips, Nashville, Tenn.

SUMMARY OF THE WEEK.

Baltimore.

LABORATORY. — E. F. Baldwin, architect, has prepared plans for the Trustees of the Johns Hopkins University, for a four-st'y and basement brick and brown-stone trimming building, 71′ x 117′, with tower 95′ high, to be erected cor. Monument and Garden Sts.; Messrs. William Ferguson & Bro., builders.

BUILDING PERMITS. — Since our last report twenty-three permits have been granted, the more important of which are the following: —

J. D. Taylor, 5 three-st'y brick buildings, w s Pennsylvania Ave., s of Presstman St.

A. S. Adler, four-st'y brick building, n e cor. Eutaw and Clay Sts.

Wyatt & Owens, 24 two-st'y brick buildings, e s Newington Pl., com. s e cor. Baker St.

F. W. Maldeis, 5 three-st'y brick buildings, s s Lexington St., w Calhoun St., and two-st'y brick stable.

W. W. Watts, 14 two-st'y brick buildings, e s Garrett Ave., bet. Beasor and Clement Sts.

Boston.

BUILDING PERMITS. — *Wood. — East Sixth St., Nos.* 459-469, 6 dwells., 15′ x 15′; owner and builder, Jas. V. Devine.

Canterbury St., near Austin St., wood-shed, 14′ x 20′; owner, Peter Donald; builder, F. B. McLaughlin.

Savin St., dwell., 19′ 11′ x 48′; owner, Dr. H. Call; builder, J. Philbrick.

Lincoln St., No. 30, dwell., 24′ x 34′; owner, Chas. E. Rogers; builder, F. H. Perham.

Boylston St., near Centre St., greenhouse, 22′ x 50′; owner, G. F. T. Reed; builder, J. D. Wester.

Unnamed St., from Norfolk St., dwell., 22′ and 26′ x 28′; owner, J. Green; builder, E. A. Carter.

Clement Ave., near Farrington Ave., dwell., 21′ x 30′; owner, Wm. Mullen; builder, W. S. Mitchell.

Wales St., near Harvard St., dwell., 21′ and 22′ x x 41′ 6″; owner, Cheever Newhall; builder, Thomas Hurd.

Spring Park Ave., opposite Burr St., dwell., 28′ x 34′; owner, Henry Brehant; builder, J. K. Bell.

Colden St., No. 28, storage, 22′ x 22′ and 30′; owner and builder, W. B. Quigley.

Brooklyn.

HOUSE. — On Willoughby Ave., a handsome house 40′ x 65′, is to be built for Mr. J. Napoleon Longhi, of brick, stone and terra-cotta; from plans of Mr. C. H. Gilbert of New York.

CLUB-HOUSE.—A large extension is to be built to the Oxford Club; from plans of Mr. John Mumford.

BUILDING PERMITS. — *McDonough St.*, s s, 300′ 1″ w Lewis Ave., 3 three-st'y brown-stone dwells., tin roofs, wooden cornices, cost, each, $6,000; owner, architect and builder, Geo. Rose, 241 Bedford Ave.

Van Buren St., n s, 110′ w Stuyvesant Ave., two-st'y shoe factory, gravel roof; cost, $5,500; owner, William Nagle, 309 Hart St.; architect and contractor, W. H. Doughty; mason, M. J. J. Reynolds.

Greene Ave., s s, 75′ w Patchen Ave., two-st'y brick and brown-stone dwell., tin roof; cost, $5,000; owner, Lucy Herron, 435 Pulaski St.; architect and contractor, Wm. Dawson; mason, W. M. Gibson.

Poplar St., s s, abt. 80′ w Henry St., three-st'y brick tenement, gravel roof; cost, $4,000; owner, D. S. Quimby, Henry St., cor. Poplar St.; architect, J. G. Glover; builder, not selected.

Sixteenth St., n s, 100′ w Sixth Ave., 2 three-st'y brick flats, tin roofs; cost, total, $13,000; owner, James Beith, 274 Fifteenth St.; architect and builder, W. J. Conway.

Greene Ave., n s, 260′ e Sumner Ave., two-st'y frame mansard, brick and terra-cotta dwell., tin and slate roof; cost, $10,000; owner, Isaac C. De Bevoise, 104 De Bevoise Ave.; builders, S. J. Burrows and Marimus & Gill.

Scholes St., No. 202, s s, 200′ e Humboldt St., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $4,000; owner, Math. Keoune, 212 Johnson Ave.; architect, G. Hillenbrand; builders, D. Kreuder and Aug. Wurst.

Van Voorhis St., n s, 160′ e Bushwick Ave., 2 two-st'y frame dwells., tin and shingle roofs; cost, each, $2,400; owner, Wm. H. C. Leverich, 253 Reid Ave.; architect, H. Smith; builder, O. Dennis.

Moore St., No. 56, s s, 175′ e Ewen St., three st'y frame (brick-filled) store and tenement, tin roof; cost, $4,000; owner, Eva Hess, 90 Seigel St.; architect, E. Schrempf; builders, J. Schneider and V. Ammon.

North Sixth St., s s, 100′ w Fifth St., three-st'y brick school-house, tin roof; cost, $67,000; owner, Rev. Martin Carroll, North Sixth St., near Fifth St., architect, Thos. F. Houghton; builders, J. Rooney and F. G. Turner.

Fulton St., s s, 100′ e Saratoga Ave., 15 three-st'y brick (stone front) stores and dwells., gravel roofs; cost, each, $7,500; owner, architect and builder, J. H. Herbert, 141½ Monroe St.

Twenty-third St., s s, 185′ w Fourth Ave., two-st'y frame (brick-filled) dwell., tin roof; cost, $3,600; owner, John Feitner, Twenty-fourth St.; architect, W. Wirth; builders, J. Sorenson & Kolle.

Broadway, s s, 78′ 6″ w Tenth St., 2 four-st'y brick stores and tenements, tin roofs; cost, $16,000; owner, John Harper, 244 South Ninth St.; architect, E. F. Gaylor.

Van Cott Ave., No. 151, n s, 25′ w Kingsland Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $3,800; owner and builder, Peter Smith, Van Cott Ave., cor. Kingsland Ave.; architect, Th. Engelhardt.

Boerum St., No. 248, s s, 499′ e Bushwick Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $3,800; owner, Franz Freibig, 246 Boerum St.; architect, Th. Engelhardt; builder, P. Kunzweiler.

Palmetto St., Nos. 103 *and* 105, n s, 400′ w Central Ave., 3 two-st'y frame (brick-filled) dwells., tin roofs; cost, each, $2,200; owner and builder, Mrs. Leah V. C. Naui, 71 Palmetto St.; architect, Th. Engelhardt.

Melrose St., Nos. 164 *and* 166, s s 100′ w Knickerbocker Ave., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $4,300; owner and builder, Henry Eppig, Central Ave., cor. Jefferson St.; architect, Th. Engelhardt.

Hicks St., e s, 70′ n Harrison St., four-st'y and cellar brick tenement, tin roof, wooden cornice; cost, $5,000; owner and architect, John Reilley, 292 Baltic St.

Decatur St., n s, 140′ w Sumner Ave., 5 two-st'y front and three-st'y rear brick dwells., tin roofs; cost, $26,000; owner, Mrs. Lucy E. Edwards, 12 Verona Pl.; architect, R. H. Hoile; builders, W. Bulkley and Miller & Howe.

Tenth St., s s, 395′ e Sixth Ave., 12 two-st'y brown-stone dwells., tin roofs; cost, each, $4,500; owners, architects and builders, Cozzens & Barton, 177 Stuyvesant Ave.

Hicks St., e s, 44′ n Harrison St., three st'y and cellar brick dwell., tin roof, wooden cornice; cost, $3,000; owner and architect, John Reilly, 292 Baltic St.

Tenth St., s s, 195′ e Sixth Ave., 12 two-st'y brown-stone dwells., tin roofs; cost, each, $4,500; owner, architect and builder, C. B. Sheldon, 206 Ninth St.

Duryea St., n s, 250′ e Broadway, 7 two-st'y frame (brick-filled) dwells., tin roofs; cost, each, $3,000; owner, Wm. H. H. Glover, 665 East One Hundred and Thirty-sixth St., New York; architect, John Fletcher; mason, J. Hennessey; contractor, J. Fletcher, Jr.

Herkimer St., n s, abt. 80′ e Nostrand Ave., two-three-st'y brick dwells., tin roofs; cost, each, $12,000; owner and builder, Anderson Miller, 1527 Pacific St.; architect, A. Hill.

Forrest St., s s, 72 w Evergreen Ave., six-st'y brick machine-room and storage bins, tin roofs; cost, $15,000; owners, S. Liebmann's Sons, Forrest St., cor. Bremen st.; architect, Th. Engelhardt; builders, A. Hofgesang & Son.

Grove St., No. 24, s s, 174′ 2″ e Broadway, three-st'y frame dwell., tin roof; cost, $4,500; owners and builders, Wm. Kirkland & Sons, 14 Grove St.; architect, F. Holmberg.

Johnson Ave., No. 121, n s, 100′ w Ewen St., three-st'y frame store and tenement, tin roof; cost, $3,500; owner, Fred. Zoeller, Leonard St., cor. Johnson Ave.; builders, F. Stammler and F. Roche.

Lexington Ave., n w cor. Marcy Ave., three-st'y brick flat, tin roof, wooden and iron cornice; cost, $5,000; owner, E. E. Nelson, 207 Hancock St; architect, J. T. Miller.

Putnam Ave., n s, 163′ w Sumner Ave., 9 three-st'y brown-stone dwells., gravel roofs; cost, each, $8,000; owner, architect and contractor, J. C. Bushfield; mason, not selected.

Herkimer St., n s, 450′ e Rochester Ave., three-st'y brown-stone dwell., tin roof, wooden cornice; cost, $5,000; owner, J. Fisher, 811 Herkimer St.; architect, A. Hill.

President St., s s, 75′ w Henry St., four-st'y brick tenement, tin roof; cost, $17,000; owner, H. W. Stearns, 286 Court St.; architect, T. F. Houghton; builders, J. H. O'Rourke and H. J. Smith.

Fulton St., No. 1905, n s, 275′ w Howard Ave., two-st'y frame (brick-filled) store and dwell., tin roof; cost, $3,500; owner, Louis Sturken, Fulton St.; architect and builder, S. Hertlein.

Clay St. to Box St., at point 153′ w Manhattan Ave., one-st'y frame stable on Clay St., gravel roof; cost, $3,000; owner, Brooklyn Cross Town R. R., 585 Manhattan Ave.; architect and contractor, O. L. Chase; mason, G. Stripes.

ALTERATIONS.— *Washington Ave., No.* 361, three-st'y and basement brick extension, interior alterations, etc.; cost, $5,000; owner, James P. Barnet, 270 Ryerson St.; architect, H. Kafka; builders, W. H. Whyte and A. Beinhauer.

St. John's Pl., n s, 100′ w Seventh Ave., one-st'y brick and stone foundation, slate roof, iron cornice; cost, $10,000; owner, St. John's Episcopal Church; architect, J. R. Thomas.

Seventh St., s s, 220′ e Fourth Ave., raised 6′, brick wall beneath, area in front; cost, $4,500; owners, Trustees of Lutheran Church, by H. H. Schmitt, Fourth Ave., cor. Eighteenth St.; architect, H. L. Spicer; builder, T. Bennett.

Chicago.

BUILDING PERMITS.—Mrs. K. Bourke, two-st'y flats, 318 Van Buren St.; cost, $2,500.

J. W. Gehrig, three-st'y store and flats, 348 West Madison St.; cost, $9,000.

J. Schneider, two-st'y dwell., 2440 Lasall St.; cost, $3,000.

A. Doolan, 2 two-st'y dwells., 3144-3146 Rhodes Ave.; cost, $7,000.

M. Papsohitski, two-st'y store and dwell., 3201 Wall St.; cost, $2,800.

Welsh Presbyterian Church, basement; cost, $3,000.

S. G. Bodenschatz, two-st'y dwell., 625 Taylor St.; cost, $4,000.

H. Lampke, two-st'y dwell., 163 Bissell St.; cost, $2,500.

C. Gray, 2 two-st'y dwells. and stores, 289-291 West Chicago Ave.; cost, $7,000; architect, Palmer.

Wm. Bayne, four-st'y building, 163-169 Locust St.; cost, $26,000.

T. Ognen, two-st'y dwell., 1057 Jackson St.; cost, $3,000; architect, W. Thomas.

Mrs. L. Mitchell, two-st'y store and dwell., 79 Eleventh St.; cost, $3,500; architect, Ruehl.

A. T. Ewing, 2 three-st'y dwells., 3743-3745 Ellis Ave.; cost, $5,000; architects, Cobb & Frost.

M. Kratz, three-st'y store and dwell., 2504 Wentworth Ave.; cost, $8,500; architect, J. Frank.

S. E. Tillinghurst, two-st'y dwell., 31 Pratt Pl.; cost, $3,000.

Elvey Bros., 2 three-st'y store and dwells., 918-920 West Madison St.; cost, $10,000.

R. L. Martin, 6 two-st'y dwells., 95-103 Sibley St.; cost, $18,000.

J. Lawler, two-st'y store and dwell., 566 Harrison St.; cost, $4,000.

A. Lehmann, two-st'y dwell., 119 Wilcox Ave.; cost, $4,000; architect, Thompson.

M. Born, two-st'y dwell., 3431 Michigan Ave.; cost, $8,000; architect, L. B. Dixon.

C. C. Heisen, six-st'y office-building, Dearborn St.; cost, $60,000; architect, J. M. Van Osdel.

Thos. Bird, two-st'y dwell., 117 Ohio St.; cost, $4,000; architect, L. G. Quackenboss.

M. Ryan, three-st'y store and dwell., 651 Fifteenth St.; cost, $6,000; architect, J. Killeen.

S. Downey, two-st'y dwell., 357 Marshfield Ave.; cost, $3,500; architect, Kiltenich.

H. Giesecke, 3 three-st'y stores and flats, 759-763 North Paulina St.; cost, $24,000; architect, T. Karls.

J. Sinclair, two-st'y dwell., 119 Laflin St.; cost, $5,000; architect, C. Thomas.

S. Manning, two-st'y dwell., 3315 Forest Ave.; cost, $4,000.

E. J. Lehman, 2 one-st'y stores, Wabash Ave.; cost, $5,000.

Studebaker Bros. M'f'g Co., eight-st'y carriage repository, 163-167 Michigan Ave.; cost, $150,000; architect, S. S. Beman.

E. W. Partridge, 7 three-stores and flats, 378-390 Thirty-ninth St.; cost, $28,000; architect, C. O. Gleason.

J. D. Shea, two-st'y flats, 3752 Wabash Ave.; cost, $2,800.

Hennessy Bros., two-st'y flats, 8-10 Cass St.; cost, $2,500.

J. C. Smith, 3 two-st'y dwells., McCallister Pl.; cost, $15,000; architect, J. G. Cochrane.

G. W. Stanford, 3 two-st'y dwells., 233-235 Armatage St.; cost, $7,500.

H. S. Weeks, two-st'y car barns, Flournoy St.; cost, $20,000; architect, J. J. Flanders.

G. Goherz, two-st'y dwell., 91 Kendall St ; cost, $2,500; architect, A. Schoof.

J. Uber, three-st'y stores and flats, 940 Milwaukee Ave.; cost, $8,000.

Josephat Association Church, two-st'y dwell., 228 Southport Ave.; architect, H. Wessner.

J. L. Campbell, 3 two-st'y dwells., 936-940 Park St.; cost, $9,000; architect, J. L. Campbell.

A. W. Fischer, three-st'y store and dwell., 691 Chicago Ave.; cost, $4,000; architect, D. Bloedner.

J. C. Anderson, two-st'y dwell., 33 Erving Pl.; cost, $3,000; architect, C. O. Hansen.

D. Cameron, two-st'y dwell., 304 Monroe St.; cost, $5,000; architect, W. Thomas.

J. Clark, additional stories, 249-251 State St,; cost, $25,000; architect, J. J. Flanders.

Cincinnati.

Building Permits. — L. Denning, two-st'y building, Pine St.; cost, $2,700.

Mrs. C. Little, two-st'y building, Kinney and Hackbery Sts.; cost, $6,000.

F. W. Brockman, three-st'y building, Mulberry and Rice Sts.; cost, $4,500.

C. Kassan, three-st'y building, Molton St. and Euclid Ave.; cost, $4,000.

P. Bradley, two-st'y building, Eastern Ave. and Vance St.; cost, $3,400.

J. Groven, three st'y building, Dayton and Coleman Sts.; cost, $6,000.

Mrs. K. Gaff, four-st'y building, Perry and Plum Sts.; cost, $7,000.

George Beyer, two-st'y frame building, Belvue St.; cost, $2,000.

H. Werdman, two-and-one-half-st'y building, Warsaw Pike; cost, $6,500.

Brockman & Co , two-and-one-half-st'y building, Ohio Ave. and Parker St.; cost, $7,123.

A. Weisenberger, Wheller & Emery; cost, $3,000.

R. Reimbold, two-st'y building, Corvein St. and McMillan St.; cost, $2,000.

S. F. Denton, two-and-one-half-st'y frame building, Locust and Gilbert Sts.; cost, $2,500.

Henry Rudmeyer, two-and-one-half-st'y frame building, New Baltimore Pike and Wayne St.; cost, $2,188.

A. Schnieder, three-st'y building, Wheeler and Clifton Sts.; cost, $2,500.

B. Dannehold, three-and-one-half-st'y building; Brown and Freeman Sts.; cost, $8,000.

Wm. Aseforth, three-st'y building, Race and Green Sts.; cost, $7,000.

L. C. Black, three-st'y building, Alpine Pl.; cost, $6,000.

J. P. Schar, two-st'y building, Westwood Ave.; cost, $2,200.

Jacob Bauer, two-st'y building, Marshal Ave.; cost, $2,500.

F. Ludke, two-and-one-half-st'y building, York and Western Sts.; cost, $2,000.

J. H. Gray, two-and-one-half-st'y frame building, Eastern and Tusculum Aves.; cost, $6,000.

Mrs. E. Enphrat, two-and-one-half-st'y building, Clifton and Warner; cost, $3,000.

F. Otte, four-st'y building, Central Ave. and Liberty St.; cost, $7,000.

H. Werdman, Hopkins St., three-st'y building; cost, $3,600.

Twenty repairs; cost, $13,020.

Repairing permits to date, 653.

Total cost to date, $1,366,673.

Minneapolis, Minn.

Building Permits. — Campbell Brothers, two-st'y wooden dwell., n e cor. East Twenty-sixth St. and Garfield Ave.; cost, $8,000.

A. Hathaway, two-st'y wooden dwell., s e cor. Hawthorne Ave. and Seventeenth St.; cost, $10,000.

City of Minneapolis, two-st'y brick engine-house, s s Holden St., between Highland Ave. and Borden Ave., n; cost, $6,800.

Fred. D. Noerenberg, eight-st'y stone malt-house, n e s Twenty-first Ave., near Twentieth Ave., s; cost, $30,000.

T. Z. Curtiss, two-st'y wooden dwell., s w s First Ave., between East Thirty-first and East Thirty-second Sts , s; cost, $3,000.

Wm. N. Holway, 3 two-and-one-half-st'y stone dwells., s w s West Third St., between Morrison and Twenty-sixth Ave., n; cost, $7,500.

J. M. Griffith, three-st'y brick veneer store and flats, n w s Fifth Ave., between Washington Ave. and Third St.; cost, $4,000.

E. E. & T. A. Whitman, two-st'y wooden dwell., s w s North Irving St., between Superior and Laurel Aves., n; cost, $5,000.

Jonas McCarty, two-st'y double wooden dwell., s w s Third St., between Fourth and Fifth Aves., n e; cost, $3,000.

Mrs. Esther Curtis, four-st'y brick store and office, No. 106 Washington Ave., s; cost, $18,000.

N. Saunders, two-st'y wooden dwell., s w s Hennepin Ave., between West Twentieth and West Twenty-second Sts.; cost, $5,000.

New York.

Apartment-House. — At Nos. 1424 and 1426 Broadway, Mr. D. S. McElroy, proposes to build from designs of Mr. F. T. Camp a fire-proof building to contain flats, bachelor suites and studios; cost about $110,000.

Association Building. — For the Young Woman's Christian Association a building 75′ x 101′ 3″, is to be erected on East Fifteenth St.; from designs of Mr. R. H. Robertson.

Depot. — On the s s Forty-second St., w Lexington Ave., the Forty-second St. and Manhattanville & St. Nicholas Ave. R. R. proposes to build a depot, 100′ x 150′.

Flats. — On the w s Second Ave., running from the n w cor. Eighty-sixth St., to the s w cor. Eighty-seventh St., 8 five-st'y flats and stores are to be built at a cost of about $170,000 for the Misses J. & S. Rhinelander and Mrs. Mary A. Stewart.

On the s s Seventeenth St., 100′ e Tenth Ave., 2 five-st'y flats, 25′ x 75′ each, are to be erected at a cost of about $32,000, by Mr. Jno. W. Decker.

Institutions. — "The Laura Franklin Free Hospital for Children," is to be built on the n s One Hundred and Eleventh St., bet. Madison and Fifth Aves.; from designs of Mr. Wm. Shickel; the building will have a frontage of 55′, and is to be three-st'y, with basement and mansard roof; Mr. Terence Kiernan has been awarded the contract.

The St. Francis Xavier College on the n s Fifteenth St., bet. Fifth and Sixth Aves., is to have an 80′ front extension, two-st'y; built from plans of Mr. W. H. Poole.

Houses. — For the Rev. J. J. Doughty, a four-st'y brown-stone house, 25′ x 60′, is to be built on the n s Seventy-ninth St., 200′ e First Ave.; from plans of Messrs. Babcock & McAvoy.

On the n s One Hundred and Fourth St., and the s s One Hundred and Fifth St., 140′ e of New Ave., 6 three-st'y and basement dwells., 16′ x 50′ each, are to be built at a cost of about $75,000, by Messrs. Anson C. Squier and N. M. Whipple.

Stores — At 62 College Pl., 2 five-st'y stores, 25′ x 100′ each, running through to 72 Warren St., are to be built by Philip B. Parker, at a cost of $55,000; from plans of Messrs. Babcock & McAvoy.

Building Permits. — *Jersey St.*, s e cor. Crosby St., five-st'y brick tenement, tin roof; cost, $12,000; owner, Seigmund T. Meyer, 67 Broadway; architect, A. L. Meyer; builder, W. F. Lennon.

Varick St., Nos. 140 and 142, one-st'y brick store, tin roof; cost, abt. $5,000; owner, Trinity Corporation, 61 Church St.; architect and builder, L. H. Williams.

West Thirty-fifth St., Nos. 520 to 524, three-st'y brick factory, tin roof; cost, $16,000; owner, John Graham, 354 West Thirty-third St.; architect, Andrew Spence.

Thirty-ninth St., n s, abt. 140′ w Second Ave., five-st'y brick tenement, tin roof; cost, about $16,000; owner, Michael Kane, 126 East Seventieth St.; architect, John McIntyre.

Eleventh Ave., Nos. 500 to 506, 4 five-st'y brick tenements with stores, tin roofs; cost, each, $13,800; owner and builder, John Totten, 240 West Forty-ninth St.; architect, M. L. Ungrich.

East Seventy-seventh St., No. 429, two-st'y brick church and school, tin roof; owner, The German Evangelical Church, on premises; architect, R. C. McLane.

Seventy-seventh St., s s, 73′ w Third Ave., 2 five-st'y brick tenements with stores, tin roofs; cost, each, $13,000; owner, Siegmund T. Meyer, 57 Broadway; architect, A. L. Meyer; builder, W. F. Lennon.

One Hundred and Eleventh St., n s, 150′ e Fifth Ave., three-st'y and mansard brick hospital, tin and slate roof; cost, $85,000; owner, F. H. Delano, Red Hook, Dutchess Co., New York; architect, William Schickel.

Alterations. — The Astor Library was closed this week for important alterations to be made.

Seventh St., No. 288, new first-st'y front and internal repairs; cost, $3,000; owner, Gerald Fitzgibbon, 258 Seventh St.; builders, Grissler & Fausel.

West Thirteenth St., Nos. 507 and 509, three-st'y brick extension, tin roof; cost, $3,500; owner, C. H. Delamater, 424 West Twentieth st.; architect and builder, J. Farrell; mason, J. Buckley.

East Thirty-sixth St., No. 11, new stone stoop; cost, $3,000; owner, Robert Hoe, on premises; architect, H. O. Avery; builder, D. Campbell.

Philadelphia.

Building Permits. — *Bolton St.*, w of Ridge Ave., two-st'y dwell., 19′ x 36′; And. Slinkle, contractor.

Eighth St., n of Huntingdon St., 5 three-st'y dwells., 15′ x 52′; Jno. Loughran, owner.

Eighth St., n of Huntingdon St., 4 two-st'y dwells., 15′ x 50′; Jno. Loughran, owner.

Mitchell St., e of Martin St., 2 two-st'y dwells., 15′ x 44′; C. F. Hardeck, contractor.

Leithgow St., n of Huntingdon St., 9 two-st'y dwells., 12′ x 40′; F. E. Hoersch, contractor.

Richmond St., s of Boekins St., two-st'y dwell., 16′ x 42′; A. M. Crosta, owner.

South Sixteenth St., No. 1016, two-st'y dwell., 16′ x 60′; Isaac Smith, owner.

Ridge Ave., No. 916, three-st'y hotel, 18′ x 70′; A. A. Harmer, owner.

Tioga St., w of Waterloo St., 10 two-st'y dwells., 14′ x 42′; Theo. Holly, owner.

Girard Ave., w of Fifty-first St., 16 two-st'y dwells., 14′ x 37′; Jno. Bateson, owner.

Coulter St., cor. Morris St., 4 two-st'y dwells., 15′ x 40′; F. C. Barr, owner.

Nineteenth St., n of Dickinson St., 2 two-st'y dwells., 16′ x 46′; M. B. Stackhouse, owner.

Filbert St., No. 1203, four-st'y factory, 16′ x 107′; T. Murfrees, contractor.

Bridge St., cor. Walker St., two-st'y dwell., 44′ x 65′; stable, 42′ x 46′; Jas. C. Doyle, contractor.

Olive St., e of Nineteenth St., three-st'y dwell., 16′ 6″ x 24′; Samuel Rea, contractor.

Twelfth St., n of Jefferson St., three-st'y dwell., 15′ x 70′; J. H. Billington, contractor.

Eighth St., n of Green St., addition to church, 11′ x 80′; contractor, same as last.

Clymer St.. Nos. 627 and 629, stable, 26′ x 41′; C. J. Kelly, contractor.

Cumberland St., e of Broad St., 4 three-st'y dwells., 17′ x 48′, Jos. Stuckey, contractor.

Sharswood St., w of Twenty-fifth St., 3 two-st'y dwells., 16′ x 28′; H. Thornton, owner.

Wright St., w of Twenty-fifth St., 3 two-st'y dwells., 15′ x 40′; H. Thornton, owner.

Carpenter St., w of Seventeenth St., three-st'y dwell., 16′ x 48′; Geo. Barbiere, contractor.

Ridge Ave., s e cor. Montgomery Ave., three-st'y store, 18′ x 50′; A. R. Schoch, owner.

Lehigh Ave., near Germantown Ave., three-st'y dwell.; Chas. Bassett, contractor.

Somerville St., near Germantown Ave., 3 two-st'y dwells.; contractor, same as last.

Nicetown Lane, e of Twenty-second St., 12 three-st'y dwells.; Geo. W. Beabon, owner.

Twenty-seventh St., n of Columbia Ave., 9 two-st'y dwells.; Jacob E. Ridgway, owner.

Nineteenth St., cor. Hamilton St., factory; John Manderson, contractor.

Lambert St., s of Tasker St., 7 two-st'y dwells.; Wm. Ellsus, owner.

Oakford St., w of Twenty-first St., 10 two-st'y dwells.; H. R. Coulomb, owner.

Second St., n of Arch St., four-st'y store; Benj. Leech, owner.

St. Louis.

Building Permits. — One hundred and one permits have been issued since our last report, thirteen of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows: —

A. Worthage, three-st'y frame dwell.; cost, $3,300; J. W. Havens, contractor.

G. S. Bulkley, three-st'y frame dwell.; cost, $3,500; G. S. Bulkley, contractor.

J. B. Woestman, 2 two-st'y stone dwells.; cost, each, $4,500; H. C. Brinkmeyer, contractor.

John Hines, two-st'y brick store and dwell.; cost, $2,500; P. Tolck, contractor.

W. Wahlers, two-st'y brick store and dwell.; cost, $7,000; H. Ellerman, contractor.

H. Rohlfing, two-st'y brick dwell.: cost, $2,500; contractor, same as last.

J. Loesch, 3 adjacent two-st'y brick tenements; cost, $4,500, Dorr, contractor.

P. Ennis, two st'y brick dwell.; cost, $3,000; P. J. Meagher & Sons, architects; contract sub-let.

H. Almstean, 2 adjacent two-st'y brick dwells.; cost, $4,700; Louis Weber, contractor.

Fred W. Podmore 4 adjacent two-st'y brick tenements; cost, each, $3,000; Fred W. Podmore, contractor.

John Schultz, three-st'y brick tenement; cost, $8,500; Bothe & Rotmann, contractors.

Wm. Keane, two-st'y brick dwell.; cost, $4,000; contract sub-let.

J. L. Etzkarn, two-st'y brick dwell.; cost, $3,800; Taylor, architect; P. Richers, contractor.

Joe C. Prichard, two-st'y brick dwell.; cost, $5,500; Aug. Beinke, architect; J. H. Keefe, contractor.

W. B. Morgan, 2 adjacent two-st'y brick dwells.; cost, $3,800; W. B. Morgan, contractor.

J. Mahon, 2 adjacent two-st'y brick dwells.; cost, each, $11,000; J. Mahon, contractor.

John Ferrara, 3 adjacent two-st'y brick tenements; cost, $4,700; H. W. Rocklage, architect; S. Walter, contractor.

Wm. Graham, two-st'y brick store and dwell.; cost, $3,000; Wm. Graham, contractor.

M. Barklage, 4 adjacent two-st'y tenements; cost, $6,500; Henry Snedhoelter, contractor.

J. C. Morrison, two-st'y brick dwell.; cost, $5,000; J. C. Morrison, contractor.

John Herl, 2 adjacent two-st'y brick dwells.; cost, $3,400; Thos. Knittel, contractor.

A. Ausman, two-st'y brick flat; cost, $4,450; F. Bonny, contractor.

William Whittinger, two-st'y brick dwell; cost, $4,300; Wm. Whittinger, contractor.

Mrs. Kennel, two-st'y double brick tenement; cost, $3,250; contractor, same as last.

C. Kamper, two-st'y dwell.; cost, $3,250; Wm. Whittinger, contractor.

M. Obrecht, two-st'y brick dwell ; cost, $3,250; contractor, same as last.

Mrs. Kennel, two-st'y brick dwell.; cost, $3,300; contractor, same as last.

W. J. Gerritgen, two-st'y brick dwell.; cost, $2,500; Kluthe & Boeke, contractors.

C. Valleroy, two-st'y double brick tenement; cost, $2,700; Thomson & Valleroy, contractors.

Future City Oil Works, two and three st'y brick oil refinery; cost, $7,000; J. F. Rivers, contractor.

R. B. Lyle, two-st'y brick dwell.; cost, $6,500; J. B. McElfatrick & Son, architects; S. H. Hoffmann, contractors.

St. Paul.

Building Permits. — Two-st'y frame double dwell., e s of St. Paul Street, between Somerset and Olmstead St.; cost, $5,000; owner, Wm. Richardson.

Two-st'y frame block of dwells., s s of Fifteenth St., between Canada and Broadway; cost, $4,000; owner, Harvey Hill.

Two-st'y brick dwell., cor. Minnesota and Ninth St.; cost, $5,850; owner, Lilly M. Des Menil.

Two-st'y frame dwell., w s of Albion St., between Waltham and Seronia Sts.; cost, $3,250; owner, O. L. Rheaume.

Two-st'y brick block of dwells., w s of John St., between Grove and East Tenth St.; cost, $16,000; owner, Catherine Darragh.

Two-st'y frame dwell., e s of Albion St., between Feronia and St. Anthony; cost, $3,000; owner, Miss Anna B. Osborn.

Two-st'y frame dwell., e s of Albion St., between Feronia and St. Anthony; cost, $2,800; owner, Chas. Long.

COMPETITION.

School-House.] **[At Nashville, Tenn.**

The Board of Public Works and Affairs of Nashville, Tenn., solicit designs for a school-building, to be erected in the western part of the city, and will furnish to any one applying therefor a printed slip containing all information desired. Designs must be delivered by **September 1, 1885.**

BOARD OF PUBLIC WORKS AND AFFAIRS.

505

Memorial to General Grant.

We offer three prizes of $50 each for the best three "preliminary sketches" of a design for a Memorial to General Grant, to be erected in a large town at a cost not exceeding $100,000.

Conditions: — Drawings to be received at this office **on or before Saturday, September 19, 1885.** Drawings to be at any scale in pencil or ink — no brush-work or color — the scale to be indicated on the drawing. A brief memorandum of material and probable cost to appear *on the drawing itself.*

Each design to be represented by perspective (or elevation) with plan, and, if necessary, section at smaller scale.

Each design to be signed by a motto, and the author's name forwarded under seal. In case of publication, the author's name will be announced, unless request is made to the contrary. The award will be made by a jury of architects and sculptors.

509 EDITORS OF THE "*American Architect.*"

PUBLISHERS' DEPARTMENT.

The AMERICAN ARCHITECT and BUILDING NEWS

Published Every Saturday by

The American Architect and Building News Company,

[No change in the editorial management].

211 TREMONT ST., BOSTON, MASS.

Price. — Regular Weekly, Per year in advance $6.00
" " half-year " " 3.50
Gelatine, " per year " " 7.00
" " half-year " " 4.00
Monthly numbers, per year in advance 1.75
" " half-year " " 1.00
Single copies Regular .15
" " Gelatine .25

Past Issues. Unbound. Bound.
1876, '77, '78, '79 per volume, $9.00 $10.50
1882, '83, '84 " " 7.50 9.00

Binding. — In maroon cloth with stamped back and side $2.00 per yearly volume. Similar covers supplied at $1.00 each.

N. B. We do not exchange bound for unbound volumes however perfect they may be.

Remittances. — Remittances should be made by check, draft or postal money-order.

Changes of Address. — Requests to change the address of a paper should mention both new and old addresses.

Specimen Copies furnished on the receipt of fifteen cents.

Advertising Rates furnished on application.

"Wants," and "Proposals," 15 cents a line. $1 the lowest charge.

Advertisements not received later than Thursday noon.

Discontinuances. — The courts invariably hold a subscriber responsible to the publisher for the subscription price of all papers received by him until arrearages are paid, and the paper ordered to be discontinued.

Drawings returned uninjured after publication.

WARNING.

Any one paying money for his subscription to any Agent does so at his sole risk.

NOTICE.

The *American Architect* can be obtained, *flat*, and subscriptions made at the following places.

BOSTON: —
Ticknor & Co., 211 Tremont St.
Cupples, Upham & Co., cor. Washington and School Sts.
BUFFALO, N. Y.: —
A. J. Hawks.
Peter Paul & Co.
CLEVELAND, O.: —
Van Epps & Co.
CHICAGO, ILL.: —
Pierce & Snyder, 122 Dearborn St.
J. W. Taylor, 146 La Salle St.
DETROIT, MICH.: —
K. T. Ives, 16 Baldwin Place.
NEW YORK: —
Brentano's Literary Emporium, 5 Union Sq.
W. T. Comstock, 6 Astor Place.
CINCINNATI, O. —
Thomas Morton, 162 Vine St.
PITTSBURGH, Pa. —
R. S. Davis & Co.,
W. W. Edgar,
ROCHESTER, N. Y.: —
Scranton, Wetmore & Co.
C. E. Darrow.
ST. LOUIS, MO.: —
Philip Roeder, 322 Olive Street.

New Advertisements.

J. K. BRIGHAM (New York, N. Y.), Tiles. Page iii.
WASHBURN & MOORE M'F'G CO. (Yonkers, N. Y.), Water-Closets. Page xvii.
J. S. THORN (Philadelphia, Pa.), Window Guard. Page xv.

Dissolution of Partnership.

The Copartnership heretofore existing under the name of **JAMES R. OSGOOD & CO.**, is hereby dissolved.

JAMES R. OSGOOD.
EDWARD L. OSGOOD.
BENJAMIN H. TICKNOR.
THOMAS B. TICKNOR.

Boston, July 18, 1885.

Copartnership Notice.

The subscribers have formed a Copartnership under the name of **TICKNOR & COMPANY**, for the purpose of continuing the business of Publishing and Book-selling, heretofore carried on by **JAMES R. OSGOOD & CO.**

BENJAMIN H. TICKNOR.
THOMAS B. TICKNOR.
GEORGE F. GODFREY.

Boston, July 18, 1885.

WANTED.

DECORATIVE ARTIST. — Wanted, a first-class decorative artist. Must be a good colorist, and thoroughly posted on all branches of decoration and fresco painting. Apply to the Robt. Mitchell Furniture Co., Cincinnati, O. 505

PROPOSALS.

IRON-WORK.

[At Fort Wayne, Ind.]

OFFICE OF SUPERVISING ARCHITECT, TREASURY DEPARTMENT, WASHINGTON, D. C., August 26, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 10th day of September, 1885,** to furnish and put in place all the iron beams, columns, etc., required for the court-house, etc., building at at Fort Wayne, Ind., in accordance with drawing and specification, copies of which and any additional information may be had on application at this office or the office of the superintendent.

Bids must be accompanied by a certified check for $300.

R. H. THAYER,
505 Acting Supervising Architect.

ALTERATIONS.

[At Oxford, O.]

Sealed proposals will be received by the Board of Trustees of the Miami University, **up to noon of the 17th day of September, 1885,** at the Secretary's office, University Building, in the village of Oxford, O., for material and labor required in the alteration and repairs of the Miami University Buildings, in accordance with plans and specifications by D. W. Gibbs & Co., Architects, now on file in the office of the Secretary.

Also, at same time and place, bids will be received by said Board of Trustees for the heating and ventilating of said University buildings, parties bidding to furnish complete plans showing system contemplated.

Each bid must be accompanied by a good and sufficient bond in the sum of $1,000, conditional that if awarded the work he or they will enter into contract and give bond for the faithful performance of the same.

The Board reserve the right to reject any or all bids.

By order of the Board of Trustees.

506 R. W. BISHOP, Secretary.

PROPOSALS.

DECORATIONS.

[At Lansing, Mich.]

LANSING, MICH., August 3, 1885.

Notice is hereby given that under the provisions of Act No. 140 of the session laws of 1885, designs and proposals for decorating the walls and corridors of the capitol at Lansing are solicited, and will be received by the secretary at the office of the Board of State Auditors **until 9 A. M., on Wednesday, September 30, next.** Bids may be made in the following manner, each to be accompanied by sketches or designs showing as clearly as may be the plan upon which the work is proposed to be finished: —

Bid No. 1 for Senate Chamber and House of Representatives.

Bid No. 2 for Supreme Court-room.

Bid No. 3 for rotunda and front corridor on first floor.

Bid No. 4 for Governor's reception room.

Bid No. 5 for all of above mentioned.

The whole amount to be expended on the work is limited to $23,000.

Each bid must be accompanied by a bond of the bidder or bidders to the people of the State of Michigan in the penal sum of one thousand dollars, to be approved by any member of the commission conditioned that if any contract be awarded to him or them, he or they will, within a reasonable time to be designated by said board, enter into an agreement with said board, and furnish a bond to be approved by said board conditioned for the prompt and faithful performance of the contract so awarded.

Blank form of both bids and bonds to accompany them, and the act of Legislature authorizing the work will be furnished on application to the secretary.

The board reserves the right to reject any and all bids or design. R. A. ALGER, Chairman.

T. M. WILSON, Secretary. 508

STONE AND BRICK WORK.

[At St. Joseph, Mo.]

OFFICE OF SUPERVISING ARCHITECT, TREASURY DEPARTMENT, WASHINGTON, D. C., August 24th, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 21st day of September, 1885,** for all the stone and brick work required for the basement of the post-office, etc., building at St. Joseph, Mo., in accordance with drawings and specification, copies of which and any additional information may be had at this office, or the office of the superintendent.

Bids must be accompanied by a certified check for $500 for stone-work, and $300 for brick work.

H. G. JACOBS,
505 Acting Supervising Architect.

ARMY BARRACKS.

[At Fort Riley, Kans.]

HEADQUARTERS DEPARTMENT OF THE MISSOURI, OFFICE OF THE CHIEF QUARTERMASTER, FORT LEAVENWORTH, KAN., August 10, 1885.

Sealed proposals for the erection of two (2) set-company barracks and four (4) double sets officers' quarters, of stone, will be received at this office **until 12 o'clock noon, on Monday, August 31st, 1885** (central standard time), and opened immediately thereafter in the presence of bidders. Specifications, general instructions to bidders, and blank forms of proposals will be furnished on application to this office. Each proposal should be accompanied by a guarantee of $3,000 made upon the blank form furnished. The Government reserves the right to reject any or all proposals.

Envelopes containing proposals should be marked "Proposals for erection of buildings at Fort Riley, Kan." and addressed to the undersigned.

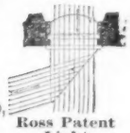
JAMES GILLISS,
Major and Quartermaster, U. S. A.
505 Chief Quartermaster.

This Cut Shows our Patent Three-bar Chilled Process, used in the manufacture of our **Composite Railings, Gates, etc.** The horizontal, as well as the upright rods, are in one piece, and the molten metal is poured and chilled on to the wrought-iron, making a perfect joint, which is equal to a solid weld. It leaves no crevices for rust or moisture to enter. We have over 100 designs of Railings, Gates, etc., made by this process. Our prices are as low as the same quality of work in cast or wrought-iron, but our Composite Work will out-last either. Specimens can be seen all over the country, but especially on the Elevated Railroad stations and the East River bridge.

COMPOSITE IRON WORKS CO.,
83 Reade St., New York

Sidewalk
— AND —
VAULT
LIGHTS.

Sole Manufacturers of the



FLOOR and ROOF LIGHTS.

DAUCHY & CO.,
125 & 127 Indiana St., (near Wells),
CHICAGO, ILL.

Ross Patent Light.

H. W. JOHNS'
ASBESTOS
LIQUID PAINTS.

Sample Cards and Pamphlet **"Structural Decoration"** sent free by mail.
H. W. JOHNS M'F'G CO., 87 MAIDEN LANE, N. Y.
175 Randolph St., Chicago. 170 N. 4th St., Philadelphia.

TO INVENTORS AND MANUFACTURERS

The Fifty-Fourth Annual Exhibition
OF THE
American Institute
OF THE CITY OF NEW YORK,

Will open September 30, 1885. Heavy machinery will be received as early as September 14th, other goods September 21st. Intending exhibitors must make early application to secure proper space and classification. For blanks and information, address,

GENERAL SUPERINTENDENT.
American Institute, New York City.

PROPOSALS.

SEWER.

[At Cleveland, O.]

CITY CIVIL ENGINEER'S OFFICE, CLEVELAND, O., August 13, 1885.

Sealed proposals will be received at the office of the Board of Improvements **until 12 o'clock, M., September 10, 1885,** for the construction of a sewer in Scranton Ave., between Willey St. and Holmden Ave.

Plans and specifications may be seen and blank proposals can be obtained at the office of the City Civil Engineer after September 7, 1885.

Each proposal must contain the full name of the party or parties making the same, and all parties interested therein, and must be accompanied by a bond of $500, with good and sufficient surety that, if the same is accepted, a contract will be entered into.

No proposals will be entertained unless made on the blanks furnished by the engineer.

The city reserves the right to reject any or all bids.

By order of the Board. C. G. FORCE,
506 City Civil Engineer.

PAINT, LEAD, OIL, ETC.

[At Brooklyn, N. Y.]

NAVY PAY OFFICE, 27 STATE ST., NEW YORK, August 20, 1885.

Proposals, in duplicate, sealed and indorsed on envelope "Bids for Supplies," will be received at this office **until 12 o'clock, M., September 17, 1885,** for the following supplies, of best quality, to be delivered within twenty days from date of award in the Brooklyn Navy Yard, free of expense to the Government, and subject to the usual conditions and inspection.

BUREAU OF YARDS AND DOCKS.

1,730 gallons of asphaltum paint, or paint equal thereto.

White lead, zinc, oil, glass, etc., as per schedules, which can be seen at this office or at the Navy Yard.

The right is reserved to reject any or all bids, and bids only from manufacturers of or regular dealers in the articles required will be considered.

Blank forms for proposals will be furnished at this office.

Two responsible sureties are required for the prompt and faithful delivery of the articles awarded, and the competency of the guarantors certified to before a notary or other public officer.

A. H. GILMAN,
506 Pay Director, United States Navy.

NOVELTY LOCK COMPANY,

CHICAGO, ILL., U. S. A.,

MANUFACTURE THE PRACTICAL, IMPROVED AND PERFECTED

DOOR KNOB.

The most Simple Lock and Door Knob in existence, and the Strongest.

Property Owners planning to build, Architects, Contractors and Carpenters, write for new Illustrated Price-List and Sample Knob and Lock on hand-block, or a pair of Knobs and Lock for use on office or shop door when a trial is desired—complimentary. Address,

NOVELTY LOCK CO., 15 N. Clinton St., Chicago, Ill., U. S. A.

1885 CATALOGUE NOW OUT.

PEET VALVE CO.,

Manufacturers of

DOUBLE

GATE-VALVES

—FOR—

STEAM,
WATER,
GAS, Etc.

163 Albany St., Boston.

American Fire Insurance Co., Phila.

CASH CAPITAL	400.000.00
Reserve and Liabilities	852,970.05
Surplus	551,548.96
Total Assets Jan. 1, 1884.	1,804,519.21

J.B.&J.M.CORNELL,

MANUFACTURERS OF

IRON

COLUMNS, LINTELS,

AND

GIRDERS,

DEALERS IN

BEAMS AND CHANNELS.

141 CENTRE ST., NEW YORK.

PROPOSALS.

SUBMARINE TELEGRAPH CABLE.
[At Martha's Vineyard, Mass.]

SIGNAL OFFICE, WAR DEPARTMENT,
WASHINGTON CITY, August 5, 1885.

Sealed proposals in triplicate, subject to the usual conditions, will be received at this office **until 12 o'clock, noon, on Tuesday, the 25th day of August, 1885,** for furnishing, delivering and laying twenty-four nautical miles submarine telegraph cable from Nantucket Island, Mass., to Martha's Vineyard, and thence to the mainland of Massachusetts.

Specifications of the cable, and full information in accordance with this advertisement, can be obtained at this office.

Proposals must be enclosed in suitable envelopes marked "Proposals for Submarine Cable," and addressed to the Chief Signal Officer of the Army, Washington, D. C.

The right is reserved to reject any or all bids, and to waive any defects. FRANCIS B. JONES,
Captain and A. Q. M.,
505 Acting Chief Signal Officer, U. S. Army.

PROPOSALS.

JAIL.
[At Montgomery, Ala.]

OFFICE OF THE BOARD OF REVENUE,
OF MONTGOMERY COUNTY,
MONTGOMERY, ALA., July 28, 1885.

Sealed proposals will be received by the Board of Revenue of Montgomery County, Ala., **until 12 M., Monday, September 7th, 1885,** for the erection and completion of a new brick jail building, containing twenty-four steel cells in the City of Montgomery, Ala.

Bids will be received for the entire work, or separately for the iron and steel part, and for the different parts of the building.

The drawings and specifications can be seen at the office of the Board of Revenue, Montgomery, Ala., and also at the office of Bruce & Morgan, Architects, Atlanta, Ga. The Board of Revenue reserves the right to reject any or all bids. W. H. HUBBARD,
506 Clerk.

ARMY BUILDING.
[At San Antonio, Tex.]

HEADQUARTERS DEPARTMENT OF TEXAS,
OFFICE OF CHIEF QUARTERMASTER,
SAN ANTONIO, TEX., August 10, 1885.

Sealed proposals in triplicate, subject to usual conditions, will be received at this office **until 12 o'clock, noon, on the 10th day of September, 1885,** at which time and place they will be opened in presence of attending bidders, for the construction, at San Antonio, Tex., of eighteen buildings, according

PROPOSALS.

to plans and specifications on file in this office, which will be furnished on application, together with blank proposals and circulars giving full instructions as to manner of bidding and terms of contract.

The Government reserves the right to reject any or all proposals.

Envelopes containing proposals should be marked "Proposals for Construction at San Antonio, Tex." and addressed to the undersigned.

J. G. C. LEE,
506 Major and Chief Quartermaster.

SCHOOL-HOUSE.
[At Park River, Dak. Ter.]

PARK RIVER, D. T., August 5, 1885.

Sealed proposals for building a school-house at Park River, in School District No. 78, of Walsh County, Dakota, will be received by the undersigned **until 12 o'clock, M., on Saturday, the 5th day of September, 1885,** said building to be in accordance with plans and specifications for the same, furnished by the School Board of said District, now on file with W. D. Bates, director thereof, at the Park River *Gazette* office, in Park River, D. T.

Building will be two-st'y, brick-veneered, 48′ x 50′, with stone and brick foundation, and bids will include all labor and materials furnished complete.

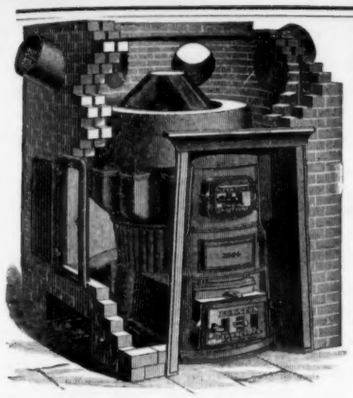
Said Board reserves the right to reject any and all bids.

O. C. WATERMAN,
505 District Clerk, Park River, D. T.

Classified Advertisements.

[Advertisers can be indexed only under a single head free of charge.]

Annunciators. PAGE
Edwards & Co., New York iv
W. R. Ostrander & Co., New York ix
Western Electric Co., New York & Chicago viii
Asbestos Felt.
The Asbestos Packing Co., Boston & New York xix
Asbestos Paint.
H. W. Johns M'f'g Co., New York xi
Asphalt. Henry R. Bradbury, New York x
New York Mastic Works i
Bell Founders.
H. McShane & Co., Baltimore iv
Blind-Awnings.
F. A. North & Co., Boston ix
Boiler-Covering.
Shields & Brown, Chicago vi
Books and Journals.
Wm. T. Comstock, New York x
Sanitary News, Chicago xvii
Tickner & Co., Boston iii
Brass Goods.
Manhattan Brass Co., New York i
Brick (Ornamental).
Anderson Pressed Brick Co., Chicago xviii
A. T. Chur, New York xviii
Hydraulic Press Brick Co., St. Louis xviii
Peerless Brick Co., Philadelphia xviii
Waldo Bros., Boston xvii
Carpets. W. & J. Sloane, New York i
Cement.
James Brand, New York xviii
Bactjer & Meyerstein, New York xviii
Brooks, Shoobridge & Co., New York xviii
Howard Fleming, New York x
Johnson & Wilson, New York xx
Marcial & Co., New York iv
Sinclair & Babson, New York, N. Y xviii
Standard Cement Co., Hartford, Conn xviii
Chair-Seating.
A. H. Andrews & Co., New York and Phila ix
Harwood Chair Seat Co., Boston ix
Clocks for Public Buildings.
Seth Thomas Clock Co., Thomaston, Conn iv
Conductors (Water).
Austin, Oddyke & Co., Philadelphia ii
Boston Spiral Tube Works, Boston ii
Solderless Standing-Seam Conductor Co., Allegheny, Pa ii
Conservatories.
Arthur E. Rendle, New York i
Contracting.
Flynt Building & Construction Co., Palmer, Mass. i
Coppersmiths and Metal-Workers.
G. L. Swett & Co., Boston iv
Cornices (Galvanized-Iron).
Mesker & Bro., St. Louis, Mo. xv
Creosote Stains.
S. Cabot, Jr., Boston vi
Decorative Leather.
C. R. Yandell & Co., New York i
Decorators.
Cox Sons, Buckley & Co., New York ii
L. Haberstroh & Son, Boston iii
Donald McDonald, Boston ii
W. J. McPherson, Boston iii
Frank Hill Smith, Boston ii
William Wright, New York ii
Door-Hangers.
Conoes Iron Foundry and Machine Co., Cohoes, N. Y iv
Electric-Light Wiring.
Chas. J. Kiem & Co., New York ix
Elevators, etc.
A. Brewer, Boston v
Crane, New York & Chicago i
L. S. Graves & Son, Rochester, N. Y i
Elevators, etc. (*continued*).
Geo. C. Howard, Phila. v
H. B. Martin, Chicago, Ill. v
Moore & Wyman, Boston i
Morse, Williams & Co., Philadelphia iv
Otis Brothers & Co., New York i
Stokes & Parrish, Philadelphia i
Whittier Machine Co., Boston i
T. Wile, Boston v
Engines (Storie Pumping).
Delamater Iron Works, New York x
Engines (Gas).
Schleicher, Schumm & Co., Philadelphia ix
Exhibition.
American Institute, New York xi
Fire-proof Building.
Fire-Proof Building Co., New York xix
Frank Lyons, Jr., New York xix
Henry Maurer, New York xix
Ottawa Tile Co., Chicago xix
Raritan Hollow and Porous Brick Co xix
John J. Schillenger, New York xix
Wright Fire-Proofing Co., New York xix
Floors (Inlaid).
National Wood M'f'g. Co., New York xx
Wm. Hannam & Co., New York xx
W. C. Runyon & Co., Rochester, N. Y ix
W. E. Wheeler, Toledo, O. iv
Fret-Work.
C. S. Ransom & Co., Cleveland, O ix
Friction-Clutch.
A. & F. Brown, New York v
Furniture. Keeler & Co., Boston x
Gas-Fixtures.
Archer & Pancoast M'f'g Co., New York x
Mitchell, Vance & Co., New York i
Gas-Machines.
Combination Gas-Machine Co., Detroit ix
Denny Bros. & Co., New York ix
Gas Machines (*continued*).
Pa. Globe Gas-Light Co., Phila. ix
Pittsburgh Supply Co., Pittsburgh, Pa ix
Tirrill Gas-Machine Co., New York ix
Gas-Stoves.
Goodwin Gas-Stove Co., Phila vii
Gas-Piping.
J. F. Dalton, Boston i
Glass.
Crystal Plate-Glass Co., St. Louis, Mo iii
Glass Roofing.
Arthur E. Rendle, New York i
Glass (Stained and Ornamental).
James Baker & Son, New York ii
Wm. Coulter & Son, Cincinnati ii
Decorative Glass M'f'g Co., Chicago, Ill ii
George Drake, Cleveland, O ii
Otto F. Falck & Co., New York ii
Alfred Godwin & Co., Phila. ii
R. S. Groves & Steil, Philadelphia ii
H. Edgar Hartwell, New York iii
John Matthews, New York iv
McCully & Miles, Chicago ii
W. J. McPherson, Boston ii
Donald MacDonald, Boston iii
Redding, Baird & Co., Boston ii
Samuel West, Boston ii
Grates, etc.
J. S. Conover & Co., New York xx
Henry Dibblee, Chicago iii
Eureka Grate Works, Cincinnati, O iv
W. H. Harrison & Bro., Philadelphia vii
W. Jackson & Son, New York vi
Edwin A. Jackson & Bro., New York x
Wm. H. Jackson, New York xx
Gutter. D. Newton, Newport, R. I xvi
Hardware. Burditt & Williams, Boston iv
Nashua Lock Co., Nashua, N. H xiii
Nichols, Bellamy & Co., Boston, Mass v



(Boynton's New Gas-Tight Furnace.)

Boynton Furnace Co.,

94 BEEKMAN ST., N. Y.

Sole Owners and Manufacturers of

BOYNTON'S CELEBRATED FURNACES,

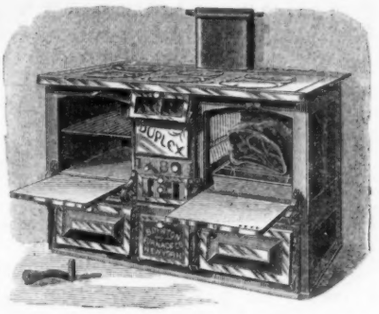
Ranges, Baltimore Heaters, etc.

With 1883-4-5 Improvements.

N. A. BOYNTON, *President.*
C. B. BOYNTON, *Sec. & Treas.*
} Inventors of all "Boynton" Furnaces, which have been on the market for over 33 years.

40 Years in this line of Business.

Over 50,000 "Boynton" Furnaces now in use.



(Boynton's Duplex Roasting and Broiling Range.)

NASHUA LOCK CO.,

NASHUA, N. H.

MANUFACTURERS OF

Builders' Hardware,

FINE CASTINGS

—IN—

Bronze, Brass, & Iron.

Full Line of Samples and Goods may be found at

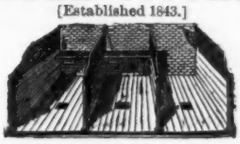
36 Pearl St., Boston, and 148 Lake St., Chicago, Ill.

THE LARGEST MANUFACTURERS IN THE UNITED STATES

—OF—

STABLE FITTINGS.

[Established 1843.]



HAY RACKS, MANGERS, ETC., ETC.

☞ Send for Prices and Catalogues.

SAMUEL S. BENT & SON,
111 Chambers St., New York.

Frank O. Worthley's Broad-Gauge Iron Stalls,

Improved Mangers, Gutters, Screens, Clock Feeders, Stable Trimmings and Novelties are the result of ten years' experience and the making of the best fittings. 53 Elm St., Boston. Illustrated Catalogue free.

Brick and Stone Water-Proofing Co.

Water-Proofing for Brick, Stone, Terra-Cotta, Stucco, etc.

ALSO FOR INTERIOR WALLS.

The disintegration of stone, the weather-staining of brickwork, the crumbling of mortar joints and the efflorescence of salts, so very noticeable on most of the finest buildings, **CAN BE PERMANENTLY PREVENTED,** and the buildings kept fresh and clean in appearance, by treating them with the above-named process.

This is the only process that will render brick and stone **PERMANENTLY WATER-PROOF** and which is **ABSOLUTELY COLORLESS AND INVISIBLE. Its PERMANENCY** is due to its being a **SOLID COMPOUND, BURNT IN BY HEAT,** and is **NOT** a fluid, such as oil or paint.

We are also prepared to clean stained and decayed buildings, or marble and stone in any other form, in a superior manner to any other process, and defy competition. **BROWN-STONE FRONTS AND STOOPS** cleaned and permanently preserved from decay.

Catalogues will be sent or any information furnished, also estimates made on buildings now standing or to be erected, by applying to or addressing the above-named Company at its offices,

55 Broadway, New York, Room 43, or 886 8th Av., near 53d St. Elevated R. R. Station,

Classified Advertisements (Continued).

Heating-Apparatus.
Bartlett, Hayward & Co., Baltimore.....i
B. C. Bibb & Son, Baltimore, Md.....vii
Boynton Furnace Co., New York.....xiii
Abram Cox Stove Co., Philadelphia, Pa.....vii
J. Reynolds & Son, Phila.....vi

Heating-Apparatus (Steam).
Bates & Johnson, New York.....vii
John Davis & Co., Chicago, Ill.....vii
"Florida" Boiler Works, Geneva, N. Y.....vii
Gorton Boiler M'f'g Co., New York.....vii
A. A. Griffing Iron Co., Jersey City.....xx
LeBosquet Bros., Boston.....viii
Newell Universal Mill Co., New York.....vii
New York Steam Co., New York.....viii
Page Steam-Heating Co., Norwich, Conn.....iv
H. B. Smith Co., New York.....vii
St. Louis Heating and Ventilating Co., St. Louis, Mo.....viii
Wilson Boiler Co., Westfield, N. Y.....vi
James P. Wood & Co., Philadelphia.....i

Heating and Ventilating.
Smith & Anthony Stove Co., Boston, Mass.viii

Heliotype Process.
Heliotype Printing Company, Boston iii

Hinges. M. W. Robinson, New York....xix

Hinges (Spring).
Van Wagoner & Williams Co., New York....xx

Horse-Stalls.
Frank O. Worthley, Boston.....xiii

Insurance.
American Fire Ins. Co.....xii
Insurance Co. of North America, Phila.....x

Iron-Work (Architectural).
Bartlett, Hayward & Co., Baltimore.....i
Boston Bridge Works.....iv
Carnegie Bros. & Co., Pittsburgh, Pa.....xv
Cheney & Hewlett, New York.....xv
M. Clements, Cincinnati, O.....iv
Composite Iron Works, New York.....xi
Cooper, Hewitt & Co., New York.....xvi
Samuel J. Creswell, Philadelphia.....xv
J. B. & J. M. Cornell, New York.....xii
J. G. & T. Dimond, New York.....xv
Manly & Cooper M'f'g Co., Phila.....xv
McHose & Lyon, Dayton, O.....xv
Mesker & Bro., St. Louis, Mo.....xvi
A. Northrop & Co., Pittsburgh, Pa.....xv
Passaic Rolling Mill Co., Paterson, N. J.....xv
Pennsylvania Construction Co, Pittsburgh, Pa.....xvi
Phœnix Iron Co., Philadelphia.....xv
Poulson & Ezer, New York xv
Union Foundry and Pullman Car Wheel Works, Chicago, Ill.....xv
Wallis Iron Works, Jersey City, N. J.....xv

Kilns. W. D. Thompson, New York.....ii

Locks.
Novelty Lock Co., Chicago, Ill.....xii
Perkins Specialty Lock Co.....xviii
Yale & Towne M'f'g Co., Stamford, Conn...xx

Machinery.
Goodell & Waters, Philadelphia.....xvi

Machinery (Laundry).
Troy Laundry Machinery Co., Troy.....xx

Mantels.
Joseph S. Miller & Bro., Philadelphia.....vii

Mantels (Slate).
Fischer-Leaf Co., Louisville, Ky.....vii

Marble Mosaics.
J. Pasquali & C. Aeschlimann, New York...iii
Stillman & Nicoll, Boston, Mass.....ix

Marble-Workers.
A. L. Fauchere & Co., New York.....ii
Robert C. Fisher, New York.....i

Metal-Work (Art).
Joseph Neumann, Philadelphia.....xvi

Metal-Workers.
J. & R. Lamb, New York.....ii

Mineral Wool.
U. S. Mineral Wool Co., New York.....iv

Mortar Colors.
American Soapstone Finish Co., Nashua, N. H.....iv
Samuel H. French & Co., Philadelphia.....iv

Mortar Black.
Henry D. Dupee, Boston.....xviii

Oil Finish.
Berry Bros., Detroit, Mich iv

Paint.
F. W. Devoe & Co., New York.....vi
Liquid Glass Paint Co., Hartford, Conn.....iii

Photographs.
J. W. Taylor, Chicago, Ill.....i

Pipe-Covering.
The Chalmers-Spence Co., New York.....vii

Pumps (Steam).
Geo. F. Blake M'f'g Co, Boston and New York xvi
H. R. Worthington, New York and Boston..v

Reflectors.
Bailey Reflector Co., Pittsburgh, Pa.....xx
I. P. Frink, New York.....xx

Registers.
Tuttle & Bailey Man'f'g Co., New York and Boston.....viii

Rolling-Shutter.
J. G. Wilson, New York.....x

Roofing Materials.
Cambridge Roofing Co., Cambridge, O.....xiv
Cincinnati Corrugating Co., Cincinnati, O..xv
W. Ehret Roofing Co., Philadelphia, Pa.....x
Eureka Slate Co., Poultney, Vt.....xiv
Garry Iron Roofing Co., Cleveland, O.....xiv
Merchant & Co., Phila.....xiv

Roofing Materials (*continued*).
N. E. Felt Roofing Co., Boston.....xiv

Roofers.
John Farquhar's Sons.....x

Sanitary Supplies.
Myers Sanitary Depot, New York.....xx
Sanitas Manufacturing Co., Boston.....xvi

Sash-Chains.
Smith & Egge M'f'g Co., Bridgeport, Conn...xx

Sash-Cord.
J. P. Tolman & Co., Boston.....x

Sash-Locks.
Chandler & Farquhar, Boston.....xvi

Scenery (Theatrical).
Lafayette W. Seavey, New York.....xx

Schools (Architectural).
Columbia College, New York.....vi
Cornell University, Ithaca, N. Y.....vi
Harvard University, Cambridge, Mass.....vi
Institute of Technology, Boston.....vi

Screens.
American Screen Co., Brookline, Mass.....ix

Sewer-Gas Trap.
H. P. Bower & Co., Cleveland.....xvii

Shingle-Stains.
S. Cabot, Jr., Boston.....v

Shutters.
Clark, Bunnett & Co., New York.....xx

Skylights, etc.
Bickelhoupt Bros., New York.....viii
G. Hayes, New York.....viii
S. J. Pardessus, New York.....viii
Arthur E. Rendle, New York.....i
John Seton, Brooklyn.....viii
G. L. Swett & Co., Boston.....iv
E. Van Noorden, Boston.....viii

Slate.
American Bangor Slate Co., Bangor, Pa....xiv
Boyle & Co., Phila., Pa.....xiv
T. F. & J. A. Hayden, St. Louis, Mo.....xiv
Story & Wilbur, Boston.....xiv
Monson Slate Agency, Lowell, Mass.....xiv

Sliding-Door Rail.
Geo. F. Taylor & Wood, New York.....xvi

Snow-Guards.
M. Halliday, New York.....xiv

Stable Fittings.
Samuel S. Bent & Son, New York.....xiii

Statuary (Bronze).
National Fine Art Foundry, New York.....xv

Stone (Building).
Hallowell Granite Co., Bedford, Ind.....xviii
M. H. St. John, New York.....xviii
Malone & Co., Cleveland, O.....xviii
Ohio Building Stone Co., Cleveland.....i
G. P. Sherwood, New York.....xviii
Terre Haute Stone Works Co., Terre Haute, Ind xviii

Stone (Building) (*Continued*).
Thomlinson & Reed, Chicago.....xviii

Terra-Cotta.
Baltimore Terra-Cotta Co., Baltimore, Md...xix
Jas. H. Beggs & Co., Wilmington, Del xviii
Boston Terra-Cotta Co.....xix
A. Hall Terra-Cotta Co., Perth Amboy.....xix
Northwestern Terra-Cotta Wks., Chicago...xix
Indianapolis Terra-Cotta Co., Ind'polis.....xix
H. A. Lewis, Boston.....xix
Perth Amboy Terra-Cotta Co.....xix

Tiles.
American Encaustic Tiling Co., New York....i
T. Asmnwall & Son, New York.....i
Alfred Boote, New York.....ii
J. K. Brigham, New York.....iii
John Chadwick, New York.....xi
Henry Dibblee, Chicago.....iii
International Tile Co., New York.....iii
J. G. & J. F. Low, Chelsea, Mass.....iii
Miller & Coates, New York.....i
Fernando Miranda, New York.....i
O. D. Person, New York.....xix
Sharpless & Watts, Philadelphia.....ii
U. S. Encaustic Tile Co., Indianapolis.....i

Traps.
F. E. Cudell, Cleveland, O.....xvii

Valves and Packing.
Jenkins Brothers, New York.....x
Peet Valve Co., Boston.....xii

Vault Lights.
Dauchy & Co., Chicago.....xi

Venetian Blinds.
Venetian Blind Co., Burlington, Vt.....xviii

Ventilation.
Globe Ventilator Co., Troy, N. Y.....viii
E. Van Noorden & Co., Boston, Mass.....viii

Wall Paper.
C. H. George, New York.....iii

Water-Closets.
E. Aspinall, New York.....xvi
Henry Huber & Co., New York.....xvii
J. L. Mott Iron Works, New York.....xvii
Washburn & Moore, Yonkers, N. Y.....xvii

Water-proofing.
Brick & Stone Waterpr'f'g Co., New York..xiii

Window-Blind Worker.
Dodd & Rice M'f'g Co., Hudson, N. Y.....iii

Window-Blinds.
Morstatt & Klatzl, New York.....x

Window-Sash.
H. A. Streeter, Chicago, Ill.....v

Wire Lathing, etc.
Clinton Wire Cloth Co., Clinton, Mass.....v

Wire and Iron Work.
National Wire & Iron Co., Detroit, Mich.....iii

Wood Ornament.
The Taft Co., Hartford Conn.....ix

EUREKA SLATE CO.,

Quarriers and Dealers in

THE ONLY PURE UNFADING GREEN ROOFING SLATE.

PURPLE, SEA GREEN, RED, and BLACK SLATES.
Also Billiards, Paving Slabs, Mantels, Urinals and all Kinds of Slate Works.
Eureka Slate Quarries, Poultney, Vt.
Outer Temple Building,
Strand, London, England.
Send for Price List.

STORY & WILBUR,

Formerly A. Wilbur & Co. (Established 1821.

EMPORIUM FOR

ROOFING SLATES

We have the entire production of
MERRILL'S
BROWNVILLE (MAINE) SLATE
ALSO THE
MONSON (MAINE) SLATE,
Both of which are Black and Unfading and the standard Slate of the market. Used by all Boston architects for first-class buildings, and the cheapest slate in the market for the quality. Also,
WELSH, BANGOR PENNSYLVANIA, STAR PENNSYLVANIA, BLACK DIAMOND PURPLE and GREEN SLATES
Roofing-Tin, Zinc, Solder, Nails, Elastic Cement, Rozin-Sized, Tarred and Dry Felts.
RED SLATES.
Our stock of Slates embraces over 20,000 squares, of all grades and prices. Particular attention to shipments by vessel or rail, for export or home trade.
Special rates by car-loads from quarries.
Inquiries promptly answered.
Slate Wharves, 529 Commercial St.,
Joseph Story. BOSTON. S. A. Wilbur.

NEW ENGLAND
Felt Roofing Co.
22 Milk St., Boston.
Originators of Felt Roofing in New England.
Inventors and only Manufacturers of the Celebrated
"BEEHIVE BRAND."

BOYLE & CO.,

419 Walnut Street, Philadelphia.
WHOLESALE
SLATE
MERCHANTS.
Close prices furnished for
Roofing Slate, Machinery Foundations, Sills, Caps, Lintels, Steps, Stairways, Flagging, Hearths, Mantels, Chimney-Caps, Wainscoting, Tanks, Vats, Grave-Boxes, Vaults, or anything made of slate.

T. F. & J. A. HAYDEN,

WHOLESALE DEALERS IN
ROOFING SLATE
Cor. Twelfth and Locust Sts. St. Louis Mo.

Unfading Black Roofing-Slates.

From the Monson (Maine) Slate Quarries.
These Slates are uniform in thickness, very strong, smooth surfaces and unfading in color.
For sale by
MONSON SLATE AGENCY.
P. O. BOX 337, LOWELL, MASS.

Crowl's Patent Iron Roofing.

The only Double-Capped Corrugated Roofing, and the only one prepared by the manufacturers ready for laying.
PLAIN IRON ROOFING,
Corrugated Iron for Siding and Roofing, and Corrugated Edge Roofing.
These goods are exhibited at the New Orleans Exposition.
Agents wanted everywhere.
CAMBRIDGE ROOFING COMPANY, - - Cambridge, Ohio.

GUARANTEED
ROOFING PLATES.

The following are a few of the opinions of practical tinners as to our Guaranteed

GILBERTSON'S
"OLD METHOD."

Monroeville, Ohio. Dec. 22, 1884.
After twenty-five years' experience running a tin-shop, doing roofing work, etc., I am free to say I have never seen any Plates that equal the *Gilbertson's Old Method* Ternes lately purchased of you.
It is all you claim for it, and on my own buildings I think I shall use no other, and shall try to have my customers let me use it for them, as I consider it economy to do so.

Marquette, Mich., Nov. 21, 1884.
As regards the *Gilbertson's Old Method* that we bought of you, would say that it is first-class and works the same.

Gallatin, Tenn., Aug. 21, 1884.
I congratulate you on your success. I think you have outstripped your competitors.

Indianapolis, Ind., Oct. 22, 1884
Your *Old Method* Plate gives better satisfaction than any Redipped Tin I have ever worked.

Bristol, Tenn., Nov. 11, 1884.
We think the *Gilbertson's Old Method* A No. 1.

Lanesville, Ind., Sept. 3, 1884.
The *Old Method* is splendid.

MERCHANT & CO.,

525 Arch Street, PHILADELPHIA.
Cliff and Beekman Streets, NEW YORK.

THE AMERICAN BANGOR SLATE CO.

Miners and Manufacturers of PENNSYLVANIA
BLACK ROOFING SLATE,
FLAGGING and other products from the famous Bangor Slate beds. The products of these beds are of uniform color, and are equal in strength and quality to any produced in Pennsylvania. ☞ It will pay builders and contractors to address THE AMERICAN BANGOR SLATE CO. BANGOR, PA.

DUGAN'S PATENT
SNOW GUARDS FOR SLATE AND OTHER SLANTING ROOFS.
Send for Illustrated Circular and Price List.

M. HALLIDAY,
Sole Proprietor and Manufacturer,
218 East Ninth Street, New York.

GARRY IRON ROOFING CO.

The largest manufacturers of Iron Roofing in the world. Manufacturers of all kinds of **Iron Roofing**, Crimped and Corrugated Siding, Iron Tile or Shingles, fire-proof Doors, Shutters, and Iron Frames for Roofs and Buildings.

IRON ORE PAINT, And Cement.
152 to 158 MERWIN ST., Cleveland, Ohio.
Send for Circular and Price-List No. 21.

Iron-Work.

UNION FOUNDRY

—AND—

Pullman Car-Wheel Works.

Architectural Iron-Work

A SPECIALTY.

Dealers in Beams, Channels, Angles, and Shapes, both Iron and Steel.

Correspondence solicited and prices given on all classes of Iron-Work.

ESTABLISHED 1852. N. S. BOUTON, Pres't.

OFFICE, 164 DEARBORN ST., CHICAGO.

THE HECLA ARCHITECTURAL BRONZE & IRON WORKS.

POULSON & ECER,

Office and Ware-rooms, 216 and 218 W. 23d St., New York.

Works, N. 11th and 3d Sts., Brooklyn, E. D., L. I.

Artistic Metal Mantels and Over-Tops, in

BRONZE, BRASS,

Oxidized-Iron, Galvano-Plastic, and Electro-Plated Iron.

Architectural and Ornamental Cast and Wrought Iron Work of every description.

Correspondence with Architects and Builders solicited. Illustrated Catalogue and Price-List on application.

McHOSE & LYON, Dayton, Ohio,

ARCHITECTURAL IRON WORKS.

IRON FRONTS FOR BUILDINGS,

Columns, Girders, Wrought-Iron Fencing, Prismatic Sidewalk-Lights, Iron Stairs. All kinds of Iron-Work used in Buildings, Grey Iron Steam-Fittings.

Designs and Estimates furnished on application.

CORRUGATED

IRON ROOFING

SIDING, CEILING.

ARCHES AND LATH.

CINCINNATI CORRUGATING CO.

CINCINNATI. O.

SEND FOR ILLUSTRATED CATALOGUE.

CRIMPED

WALLIS IRON WORKS.

Manufacturers of the

PERKINS PATENT

Fire-Proof Double Iron Shutters & Doors

For Stores and Warehouses.

Tested and recommended by underwriters throughout the United States. Catalogue with reports of tests mailed on application.

7 to 11 Morris St., Jersey City, N. J.

NORTHROP'S

PATENT PANELED IRON CEILING.

DURABLE, HANDSOME AND FIRE-PROOF.

Will not stain or crack off as plaster, or warp and burn as wood.

NORTHROP'S PAT. CAP-SEAM IRON ROOFING. Over 3,500,000 square feet used in the past ten years. Suitable for all classes of buildings. Is never out of repair. Address, A. NORTHROP & CO., CORNER 23d and MARY STS., PITTSBURGH, PA.

PENNSVLYANIA CONSTRUCTION CO.

Architectural Iron-Work,

Steel Jails, Vault-Doors, Roofs, Riveted Girders, Stairways, Bridges, Fencing, Iron Bedsteads and Cresting.

Offices: No. 132 First Avenue, PITTSBURGH, Penn.

Rolled and Drawn Steel Hand Rail, in 20 Feet Lengths.

Ornamental Iron Works.

MANLY & COOPER MANUF'G CO.

ELM AVENUE AND 43d STS., PHILADELPHIA.

BRIDGE RAILINGS
JAIL AND BANK WORK
GRILLS, ANDIRONS
SHUTTERS, DOORS, &c.

Railings, Gates, &c. for Residences and Public Institutions.

Special facilities for the manufacture of FORGED *and* PLANED *Wrought Iron Work for Interior Decorations.*

Send for Catalogue.

NATIONAL

Fine Art Foundry,

218 East 25th Street, New York.

Artists' Models cast in Standard Bronze.

Architects' Designs Executed.

Artistic and Enduring Monuments in Granite and Bronze.

No Catalogues.

MAURICE J. POWER.

J. G. & T. DIMOND,

Architectural Iron-Works.

ESTABLISHED 1852.

209 and 211 West 33d Street, New York City.

IRON

Buildings, Roofs, Fronts, Beams, Girders, Stairs, Columns, Railings, etc., etc.

Special attention given to ornamental Wrought-Iron Work.

THE

PHŒNIX IRON COMPANY,

410 Walnut St., Philadelphia, Pa.

Manufacture Rolled Beams, Channels Angles, Tee, Shape and Bar Iron of all sizes.

Roof Trusses, Girders, and Joists for fire-proof buildings framed and fitted as per plans.

PHŒNIX Wrought-Iron Columns of all sizes.

Die-forged Weldless Eyebars a specialty Designs and estimates furnished.

Boston Agents, FRED. A. HOUDLETTE & CO., 272 Franklin Street.

New York Agents, MILLIKEN & SMITH, 95 Liberty Street.

SAMUEL J. CRESWELL,

IRON WORKS,

Twenty-third and Cherry Streets,

PHILADELPHIA, PENN.

Fronts for Buildings, Columns, Girders, Wrought-Iron Beams, Sidewalk Lights, Drinking-Fountains, Garden Vases, Stairs, Crestings, Stable Fixtures, Lamp-Posts, Railings.

CHENEY & HEWLETT,

Architectural Iron Works.

Wrought and Cast Iron Work for Building Purposes.

N. CHENEY. C. HEWLETT. } OFFICE: { 201 BROADWAY, New York.

Book givingst rength of wrought-iron girders, beams, and cast-iron columns mailed on application.

Passaic Rolling Mill Co.

PATERSON, N. J.

SOLID ROLLED BEAMS,

Channels, Angles, Tees and Merchant Iron.

New York Office, Room 45. Astor House.

J. S. THORN,

Sole Agent and Manufacturer of

THE BYAR PATENT COMBINATION

CELLAR - WINDOW GUARD,

Screen and Glass Sash. All Iron on one frame.

The most complete arrangement for cellar or basement windows ever manufactured and offered to the building trade.

Nos. 1201, 1203, 1205, 1207, 1209 Callowhill St., PHILADELPHIA, PA.

CARNEGIE BROS. & Co. LIMITED.

UNION IRON MILLS.

DEPARTMENT OFFICE, 33rd ST.

BRANCH OFFICE, PITTSBURGH, PA.

MANUFACTURERS OF

WROUGHT IRON BEAMS, CHANNELS, TEES, ANGLES,

STRUCTURAL & BRIDGE IRON.

LITHOGRAPH OF SECTIONS, AND BOOK OF DETAILED INFORMATION FURNISHED ENGINEERS AND ARCHITECTS ON APPLICATION.

Iron-Work.

N.J. STEEL & IRON CO.
TRENTON, N.J.
ROLLED IRON BEAMS,
CHANNELS, ANGLES & TEES.
COOPER, HEWITT & CO.
NEW YORK.

MESKER & BRO.,
Galvanized Iron Cornices,
Window Caps and SKYLIGHTS.
Send for Catalogue.
421 to 429 South Sixth St., ST. LOUIS, MO.

Keep Your Walls Dry.

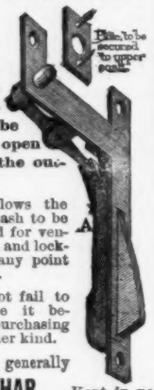
A New Cornice Gutter,
In Wood or Metal, set on furs, with a space behind for over-flow water.

Patented May 12, 1885, BY
DUDLEY NEWTON,
ARCHITECT,
Bellevue Ave., Newport, R. I.
Permits to use on any building can be obtained on payment of a royalty of $10. for each. Apply to the Patentee.
Infringements Prosecuted.

Farquhar's Improved BURGLAR PROOF Sash Lock.

This new device is a perfectly secure lock for the window which cannot possibly be forced open from the outside.

Lock applied.

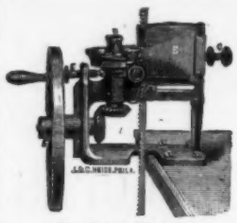


It allows the upper sash to be dropped for ventilation and locked at any point desired.

Do not fail to examine it before purchasing any other kind.

For Sale by Hardware Dealers generally
CHANDLER & FARQUHAR,
Manufacturing Agents,
177 and 179 WASHINGTON ST., BOSTON.
Kept in position by spring A.

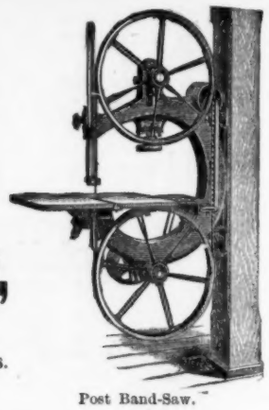
Architects, Builders, and others will confer a favor on the Publishers by mentioning "The American Architect and Building News" when sending for circulars or corresponding with parties advertising in these columns.


Band-Saw Filer.

Band-Saw Setter.

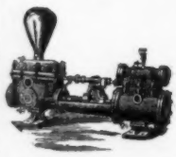
Wood-Working Machinery,

FOR PLANING-MILLS, SASH,
DOOR, AND BLIND FACTORIES,
CABINET AND CARRIAGE MAKERS.
Send for Catalogue.


Post Band-Saw.

GOODELL & WATERS,
Philadelphia, Pa.
NEW YORK WAREROOMS, 115 LIBERTY ST., NEW YORK.

GEO. F. BLAKE MANUFACTURING CO.
Makers of Steam and Power Pumping Machinery



For Public and Private Buildings
and Manufacturing Establishments.
For New Illustrated Catalogue, Address
44 Washington Street, BOSTON.
95 and 97 Liberty Street, NEW YORK.

The "Climax" Rail for Sliding Doors.

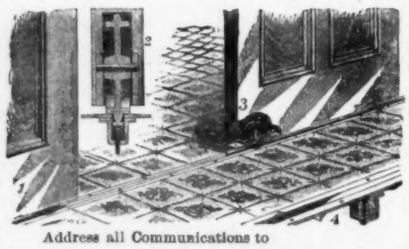


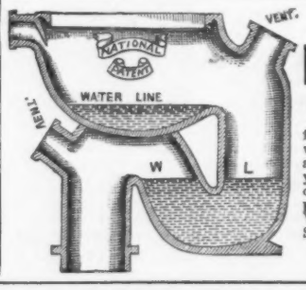
Figure 1 shows door open with centre rail level with floor. Figure 2, section of sheave, showing its position on rail. Figure 3 shows door closed with sheaves placed and centre rail depressed. Figure 4 shows track running off in the recess.

Construction simple and durable; applicable to old as well as new buildings. The door cannot jump the track.

Manufactured solely by
The "Climax" Rail Company,
NEW YORK.
Send for Price-List and Testimonials.

Address all Communications to
GEO. F. TAYLOR & WOOD, Business Managers, 134 Water St., New York.

Sanitary Appliances.



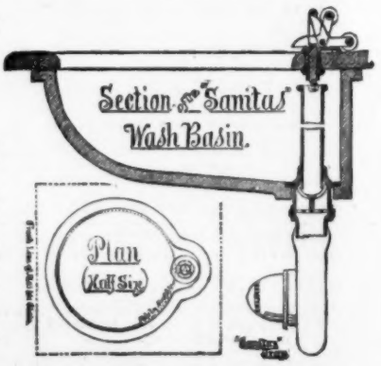
The "NATIONAL" IMPROVED FLUSH, SIDE-OUTLET CLOSET.

ADVANTAGES: Simplicity, Cleanliness, Efficiency, Cheapness.
Being **all earthernware**, and requiring no metal fittings, which foul and get out of order, there are **no parts** in Basin and Trap where **filth can accumulate**; the Basin and Trap being left clean at each flush. **25,000** have been sold since its introduction four **years ago. Prices are lower** than those of any other first-class closet claiming the same advantages. Made either complete in one piece, of earthernware or in two pieces with Basin and Trap separate. With or without seat-ventilator. Manufacturer: Thos. Twyford, Staffordshire, England.
Sole agent for the United States,
E. ASPINALL, 206 Pearl St., New York.

Without Ball Valve, or other obstruction to the water-way.

THE "SANITAS" PATENT
TRAP. WASH-BASIN. BATH-TUB. SINK. SOIL-PIPE, Etc.

These are the appliances described in the "*American Architect*," for 1883, 1884, and 1885, in the articles on "*Sanitary Plumbing*," and denominated "Anti-Siphon Trap." "Stand-pipe Basin," etc.
Col. Waring, writing of the trap ("Putnam's Trap"), in the *Century* Magazine, for Dec., 1884, says he finds it "effective in withstanding siphonage and substantially self-cleansing," and adds,
"IT SEEMS TO ME THE BEST TRAP I HAVE SEEN."
The Sanitas Wash-Basin, Bath-Tub, and Pantry-Sink, are quick emptying, without concealed passages. The Soil-pipe is cast of even thickness throughout, and jointed with steam and gas-tight joints. The "Sanitas" appliances are acknowledged by experts to be by far the best in the market.
For Sale by all Dealers in Plumbers' Supplies, or by the
SANITAS MANUF'G CO., 4 Pemberton Sq., Boston.
AGENTS WANTED.

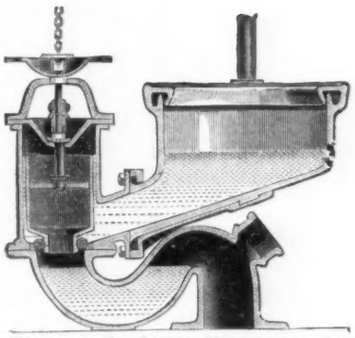


DEMAREST'S PATENT
Side-outlet, Flushing-rim, Cistern Water-Closet,
THE "HYGEIA."

We take great pleasure in calling the attention of all interested in sanitary matters to the "Hygeia." For perfect cleanliness and simplicity of construction we invite comparison with any cistern closet ever made, either of home or foreign manufacture. In short, we think as do those who have used this closet in all their fine work during the past two years, that it is *par excellence*, ahead of anything yet made in the way of a water-closet. The workmanship is of the very best kind, nothing being spared to make it a strictly first-class article in every respect, which, taken in connection with the very moderate price at which we sell it, cannot fail to place it ahead of all others in the market.

Complete Illustrated Circulars sent on application.

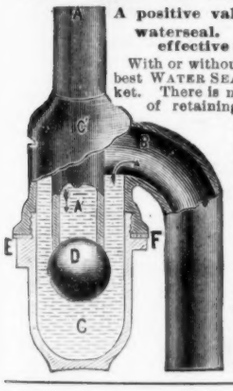
All our Sanitary Specialties are fitted up with water attached, and may be seen at our show-rooms.



The above section shows the Closet cut through the centre. All the iron-work above the trap (the trap we enamel to order) is enamelled, the Plunger and cover for Plunger section, also the Bridge and lever being galvanized and put together with brass bolts.

THE J. L. MOTT IRON WORKS,
88 and 90 BEEKMAN STREET, NEW YORK.

THE BOWER SEWER-GAS TRAP.



A positive valve Seal; a sound waterseal. Simple, cheap, effective and durable.

With or without the Valve, it is the best WATER SEAL TRAP in the market. There is no other Trap so sure of retaining its WATER SEAL. None that approximates it in the surety of the VALVE SEAL. The Valve keeps its seat by flotation, and as compared with other Valves in Traps, is little or no resistance to the outflow of water or waste. *Illustrative and descriptive 48-page pamphlet sent free on application.*

B. P. BOWER & CO.
Manufacturers,
CLEVELAND, O.

The Sanitary News.

HEALTHY HOMES AND HEALTHY LIVING.

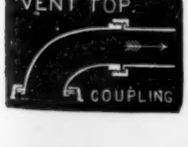
A Weekly Journal of Sanitary Science.

Office of Publication:	European Office:
113 ADAMS ST., CHICAGO, ILL.	50 FINSBURY SQ., LONDON, E. C.

Yearly Subscription Rates: ***strictly in advance.***
In the United States and Canada. . $2.00
In Foreign Countries, ... 3.00
Advertising, $2.00 an inch.

PUT INTO THE WHITE HOUSE BY THE U. S. GOVERNMENT

F. E. CUDELL'S
Patent Sewer-Gas and Backwater Trap
—FOR—
Wash-Bowls, Sinks, Bath, and Wash-Tubs.
204 Superior St., Cleveland, O.



WASHBURN & MOORE MFG. CO'S

EARTHENWARE WASHOUTS AND HOPPERS,

With Improved Flushing-Rims, and

C. H MOORE'S
Patent
METAL FOOT AND FLANGE,

Secured permanently on the discharge limb, being the only perfect connection yet made for **a Hardwood or Tile Floor.**

The serious objection made by plumbers and architects to earthenware closets in not being able to make a gas-tight and secure joint to soil-pipe with earthenware flange is now positively obviated with the use of this Metal Flange and Foot. They are perfectly true and even on face, while the earthenware cannot be made true. They are strong, and cannot be broken, while earthenware is often broken in screwing flange to floor, making the closet worthless. The face of flange is made level with top of bowl, a very desirable feature for hoppers, while with the earthenware flange it often requires a bed of putty one-quarter of an inch thick to level the fixture. When this flange is once fastened to lead bend, and the metal foot bolted to same, the earthenware fixture is secure and solid for twenty years, while with the earthenware flange, being only screwed to the floor, becomes loose in a very short time.

These Closets can be seen set up, with water attached, at

Long Hopper, Chicago or Newport.

COLWELL LEAD CO'S NEW STORE, Sixth Avenue and 59 Street N. Y. City.

WASHBURN & MOORE MANUF'G CO., Yonkers, N. Y,

Sanitary Plumbing Specialties in Earthenware and Metal Flanges.

HENRY HUBER & CO.,

Sole Manufacturers of

Boyle's Patent Siphon Closets.

See Monthly American Architect for Cuts and Explanation.

MAIN OFFICE:	BRANCH OFFICE:
85 Beekman Street, New York.	**235 Washington Street, Boston.**

Building Stones.

THOMLINSON & REED,
Quarrymen, and Dealers in
OOLITIC LIMESTONE
Quarries at Avoca, near Bedford, Ind.,
Branch Office:
Cor. Polk and Ellsworth Sts., Chicago.

Dorchester, (New Brunswick.) Yellow.
FREESTONE.
Corsehill, (Scotch.) Red.
FREESTONE.
G. P. SHERWOOD, 24 Pine St., New York.

MALONE & CO.,
Proprietors of the
Malone Blue-Stone Quarries,
Miners and Manufacturers of
SAWED AND BLOCK STONE.
Platforms up to thirty feet in length, for sidewalks, a specialty. CLEVELAND, OHIO.

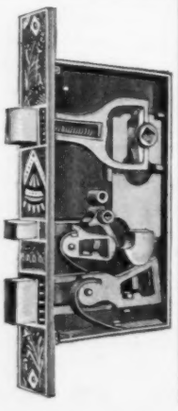
BEDFORD OOLITIC LIMESTONE,
Buff and Blue.
HALLOWELL GRANITE CO.,
Quarrymen and Dealers in
Building, Sawed, and Rough
DIMENSION STONE.
P. O. Address - - - Bedford, Ind.

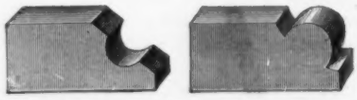
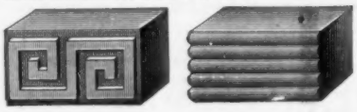
Clark's Island Granite Quarries
OF ROCKLAND, ME.
Estimates given for Building Dimensions and Monumental Work in Granite, with extra facilities for dispatch and beauty of finish.
M. H. St. JOHN,
Owner and Proprietor.
Office: 83 and 84 Astor House, New York.

Stinesville Oolitic Limestone,
The finest Building-stone in Indiana.
Columns, Lintels, Sills, etc.
Terre Haute Stone Works Co.,
Quarries and Mills on Louisville & Chicago R. R.
At Stinesville, Monroe Co.
JAMES B LYNE, President.
Office of Company, - Terre Haute, Indiana.

JAMES H. BEGGS & CO.,
Wilmington, Delaware, Terra-Cotta and
Ornamental Brick Works,
WILMINGTON, DEL.
Brick and Terra-Cotta furnished from any Design. Bricks for Arches ground to suit any Radius. Equal in Quality and Color to Philadelphia Brick.

WALPOLE MORTAR BLACK.
THE ORIGINAL.
The best in use and the only one that has stood the test of time. It improves the mortar, and is cheaper and better than Lampblack. Beware of imitations and use only the "Walpole."
HENRY D. DUPEE, Proprietor,
44 to 46 Oliver Street, Boston,
PROVIDENCE, R. I. Manchester & Hudson, Agents.
NEW YORK. Candie & Smith, foot E. 26th St. Ag'ts.

NON-PICKABLE
DOOR LOCKS
Cost no more than ordinary locks. Turning the thumb-knob closes key-hole and fastens both knob and latch, and no key can be inserted from *outside*.
We also make
Two Bolt Locks and Latches, on same principle, with full Trimmings,
Send for Illustrated Catalogue. Sample locks sent to architects on request.
PERKINS SPECIALTY LOCK CO.,
CLEVELAND, OHIO.



BRICKS!
THE HYDRAULIC
PRESS BRICK CO.
ST LOUIS, MO.
Make a Specialty of Ornamental & Plain
Red Front Pressed Brick,
Manufacturing Annually over
TEN MILLIONS.
They guarantee that the quality, finish and Color, are unsurpassed, if not unequalled by any other bricks made in the United States.


VENETIAN BLIND CO.,
Manufacturers of
ENGLISH
— AND —
AMERICAN
Venetian Blinds,
AND HILL'S PATENT
INSIDE SLIDING
Blinds.
In any wood & the nicest finish.
Every part guaranteed.
Correspondence solicited.
BURLINGTON, Vt., U. S. A.

PEERLESS
BRICKS.
THE PEERLESS BRICK COMPANY
OF PHILADELPHIA,
MANUFACTURES AND KEEPS IN STOCK
ARCHITECTURAL SHAPES, 300 KINDS.
ALSO
RED Pressed Fronts.
Extra fine in color and quality.
BUFF, Solid rich color,— beautiful.
One of the finest bricks made.
DRAB, Handsomer and more durable than stone.
BROWN, Very strong and superior to brown stone.
GRAY, A very desirable shade.
BLACK, Velvety jet face.
The only black brick fit for a fine building, producing a beautiful effect, and free from the glossy and greasy look of other black or dipped bricks.
DIAPERING and ORNAMENTAL
Bricks made in the above colors.
ARCHES OF ALL KINDS.
1003 WALNUT STREET, Philadelphia.
SAMUEL HART, PRESIDENT. JOSEPH WOOD, JR., TREASURER.
THE PEERLESS BRICK COMPANY
Wish to inform Architects and Dealers that no one is authorized to act as Agent for the sale of our manufactures.
Illustrated Catalogue and Price-List sent free on application.

TERRA-COTTA
CHIMNEY TOPS,
PHILADELPHIA
AND PEERLESS
(MOULDED) BRICK,
Akron Drain-Pipe. Portland, Roman, and Rosendale Cements. Hearth Tiles & Chimney Flue Lining.
WALDO BROS.,
88 Water Street, BOSTON.

AUGT. T. CHUR,
Room 14, 5th story, Mills Building, N. York
Importer of
"WILCOCK'S" Enamelled Bricks,
Impervious to any atmospheric effect, and may be used with perfect safety in the face of moisture and frost.

Cements.

STANDARD CEMENT CO.,
Manufacturers of
Hydraulic Cement
And Hydraulic Lime.
E. G. WESTCOTT, Gen. Eastern Agt., Hartford, Ct.
Works at
Akron, N. Y. St. Louis, Mo. Mankato, Minn.

HANOVER PORTLAND CEMENT
And the
Genuine Limmer Asphalt Mastic.
BAETJER & MEYERSTEIN,
5 Dey St., New York.

Best Brands of English and Continental
Portland Cements.
K. B. & S. English, Lafarge French,
Burham English, Lime of Teil,
Fewer German, Keene's Fine,
Jossan Antwerp, Keene's Coarse.
IMPORTED BY
JAMES BRAND, 85 BEEKMAN ST.,
NEW YORK.

SINCLAIR & BABSON,
IMPORTERS OF
PORTLAND CEMENT,
105 John St., New York.
Brands, O. F. ALSEN & SONS, and K. B. & S.
Remit 15 cts. for Practical Treatise on Cement.

BROOKS, SHOOBRIDGE & CO.,
BEST ENGLISH PORTLAND CEMENT.
Works: Grays, Essex, England.
New York Office: 7 Bowling Green.

Fire-proof Building.

THE WIGHT FIRE-PROOFING COMPANY,

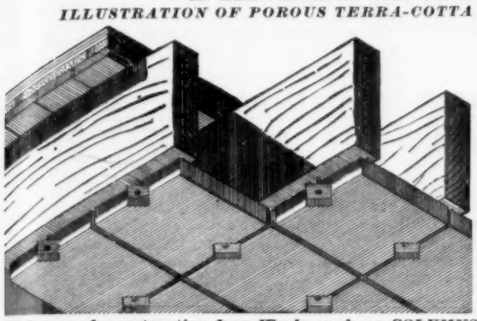
202 La Salle St., CHICAGO, 69 Washington St., NEW YORK.

CONTRACTORS FOR ALL KINDS OF FIRE-PROOF WORK IN

Porous Terra-Cotta and Hollow Fire-Clay Tiles

IN ALL PARTS OF THE UNITED STATES.

ILLUSTRATION OF POROUS TERRA-COTTA FIRE-PROOF CEILING.



500000 feet of this ceiling have been put up in Chicago, Milwaukee and Cleveland, and it is now being put in the American Bank-Note building, New York.

Patented April 16, 1878, and March 6, 1883.

All forms of constructive Iron-Work, such as COLUMNS, GIRDERS, and ROOF TRUSSES covered with POROUS TERRA-COTTA and left ready for plastering. Partitions, Furring and Roofing Furnished and Set.

FIRE-PROOF BUILDING MATERIALS.

Raritan Hollow and Porous Brick Company,

EDWARD KEASBEY, Pres't. J. C. ROSSI, Sup't. H. M. KEASBEY, Sec. and Treas.

Manufacturers of Hollow Burnt-Clay Bricks and Porous Terra-Cotta Bricks,

For Floors, Ceilings, Partitions, Furring, Roof-Lining, Column Fire-Proofing, etc.

Offices, 115 Broadway, New York, and 249 South 6th St., Philadelphia.

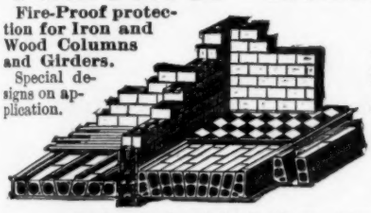
Agents: FISKE & COLEMAN, Boston. GARFIELD, FERTIG & CO., Allegheny, Pa.

Estimates Furnished. Builders Supplied. Send for Illustrated Catalogue.

GEO. M. MOULTON, Pres't. A. T. GRIFFIN, Vice Pres't. E. V. JOHNSON, Sec'y., Treas. and Gen'l. Man'g'r.

FIRE-PROOF HOLLOW BUILDING TILE

Fire-Proof protection for Iron and Wood Columns and Girders. Special designs on application.



FOR THE INTERIOR CONSTRUCTION OF BUILDINGS,

Great strength, combined with saving in space, and weight, is obtained by the use of our system of

Hollow Tile Floors, Partition Walls, Roofs, Ceilings, Etc.

Contracts taken for the erection of HOLLOW, SOLID and POROUS TILE-WORK in any part of the United States.

PIONEER FIRE-PROOF CONSTRUCTION CO.,

1545 CLARK STREET, CHICAGO.

Formerly THE OTTAWA TILE CO.,

MANUFACTURERS AND CONTRACTORS,

Dealers in every description of constructive Tile for Building Purposes.

Send for our descriptive Catalogue, giving full explanations, advantages, references, etc.

ISAAC M. HOLCOMB, President. CHARLES E. STREAT, Secretary.

Established 1873.

THE FIRE-PROOF BUILDING COMPANY,

OF NEW JERSEY.

MANUFACTURERS OF FIRE-PROOF BUILDING MATERIALS.

Porous Terra-Cotta Blocks, Hollow Burnt-Clay Bricks and Tell Lime Composition Blocks. For Arches, Partitions, Furring, Deafening, Roofing, etc.

BUILDERS SUPPLIED.

Office, 229 BROADWAY, (Rooms 12, 13 and 14,) NEW YORK, N. Y.

ESTABLISHED 1856.

HENRY MAURER, Manufacturer of

Fire-Proof Material

Of every description. Hollow Brick made of Clay for Flat Arches, Partitions, Furring, etc. Porous Terra-Cotta, Fire-Brick, etc., etc.

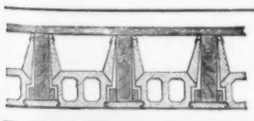
Works, PERTH AMBOY, N. J. Office and Depot, 420 EAST 23d STREET, New York.

LYONS' PATENT FIRE-PROOF

BUILDING MATERIAL,

FRANK LYONS, JR., Sole Manufacturer.

Office Room 60, Drexel Building, Cor. Wall and Broad Sts. Works, Nos. 57 to 65 Clason Ave., Brooklyn. New York Telephone, New 387. Brooklyn Telephone, Williamsburg, 391. Mechanics and Traders' Exchange, No. 14 Vesey St. (Box 82).



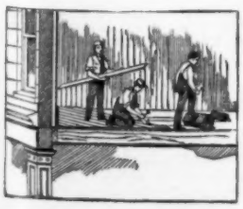
FIRE-PROOF FOR WOODEN BEAMS.

Patented August 8, 1882.

Fire-Proof Tiles for Arches, Partitions, and Furring. Also, Tiles for Protecting Wooden-Floor Beams against Fire.

Artificial Stone and Rock Asphalt pavements.

JOHN J. SCHILLINGER, 420 East 92d Street, NEW YORK.



Asbestos Flooring Felt.

Patented August 20, 1872.

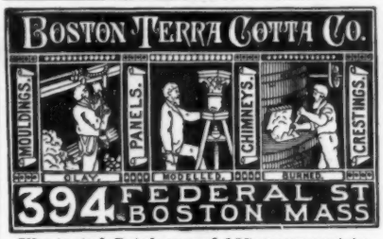
For Lining between Floors, under Slates, Shingles, Clapboards, etc.

Absolutely fire-proof, and unexcelled for deadening purposes. In rolls 44 inches wide. Manufactured only by

THE ASBESTOS PACKING CO.,

Offices: 169 CONGRESS STREET, BOSTON. 33 JOHN STREET NEW YORK.

Terra-Cotta.



Illustrated Catalogue of 125 pages sent to ARCHITECTS, BUILDERS and OWNERS,

upon application accompanied by business card.

INDIANAPOLIS

TERRA-COTTA CO.

INDIANAPOLIS, IND.

Manufacturers of

Architectural Terra-Cotta.

Send for estimates.

BALTIMORE

TERRA-COTTA CO.

Office: 30 Columbia St., Baltimore, Md.

MANUFACTURERS OF

ARCHITECTURAL TERRA-COTTA

MOULDED AND PRESSED BRICK.

PERTH AMBOY

TERRA-COTTA CO.

Nos. 80 and 81 Astor House, New York.

MANUFACTURERS OF

ARCHITECTURAL TERRA-COTTA.

BUFF AND COLORED BRICK, FIRE BRICK.

A. HALL

TERRA-COTTA CO.

Architectural Terra-Cotta, Fire-Brick, Furnace-Blocks, &c.

MOULDED, BUFF, AND COLORED BUILDING BRICK.

Perth Amboy, N. J.

Northwestern Terra-Cotta Works.

TRUE, BRUNKHORST & CO.,

ARCHITECTURAL

TERRA - COTTA.

Works: Corner Clybourn & Wrightwood Aves. Chicago. City Office: Room 20, McCormick Block

Formerly Cor. W. 15th and Laflin Sts.

Estimates given on application. Send for latest Catalogue, Price-List and Samples.

ORRIN D. PERSON,

123 5th Avenue, New York.

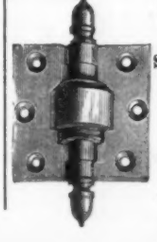
AKRON VITRIFIED ROOFING-TILE,

Finials, Ridge Cresting and Hip-Rolls.

Architectural Terra-Cotta.

Encaustic Glazed and Plain Tiles, For Floors, Hearths and Decorations.

Enamelled Bricks, A large variety of colors on hand.



Union Spring Hinges

ARE

SIMPLE, EASILY SET,

CANNOT BE PUT ON WRONG.

They work either way, right or left. All sizes. Single or double acting.

For Wire Screens or Light Doors they have no equal.

Send for Price List.

M. W. ROBINSON, Sole Agent, 79 Chambers St., New York

WM. H. JACKSON & CO. 31 E. 17th St. New York.

North Side
Union Square,
2d door from
BROADWAY.

Established, 1827.

Designers and Manufacturers
OF
Grates, Fenders
—AND—
Chimney-Piece
Appurtenances.
In fact everything pertaining to Open Fireplaces.
Importers of Tile.
Foundries and Shops,
East 28th & East 29th Sts.
Fine Castings a Specialty.

FINE HAMMERED
Metal Work
Of every description and finish for Interiors.

PRIZE MEDALLISTS.

Exhibitions of 1862, 1865, 1867, 1872, 1873, and only Award and Medal for Noiseless, Self-Coiling Steel Shutters at Philadelphia, 1876; Paris, 1878; and Melbourne, 1881.

CLARK, BUNNETT & CO. (Limited)
Late CLARK & COMPANY,
Original Inventors and Sole Patentees of Noiseless
Self-Coiling, Revolving **STEEL SHUTTERS** Fire & Burglar Proof.
Also, ***Improved Rolling Wood Shutters,*** and ***Clark's Patent Metallic Venetian Blinds.***
The BEST in the Market. Send for Catalogues, etc., to
162 and 164 West 27th St. - - New York.

PARQUET FLOORS.
WM. HANNAM & CO.
7-8 inch tongued and grooved, European Styles, Solid and Substantial Also 3-8 inch Fancy Wood Carpet Floors.
293 FIFTH AVENUE, NEW YORK. Wholesale and Retail.

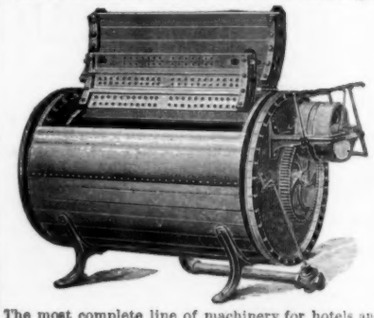
PARQUET FLOORS.
The National Wood Manufacturing Co.,
Of 16 East 18th St., New York.
REMOVED to 129 5th AVE.
INLAID WOOD FLOORS, 5-16 and 7-8 inch thick.
Designs and estimates on application. Established 1867.

FINE LOCKS
FOR ALL PURPOSES.
"Yale" and "Standard."
Catalogues on application.
The YALE & TOWNE MANUFACTURING CO., STAMFORD, CONN.
62 Reade St., New York. | 15 N. Sixth St., Philadelphia.
224 Franklin St., Boston. | 64 Lake St., Chicago.

BUNDY

RADIATORS.

Troy Laundry Machinery Co.,
LIMITED. TROY, N. Y.
Salesrooms: New York and Chicago.



The most complete line of machinery for hotels and Public Institutions. Complete laundries for Institutions our specialty.
Estimates furnished. Send for Illustrated Catalogue.

[Established 1865.]
Scenery for Theatres, Public Halls and Amateurs.
Lafayette W. Seavey, 8 Lafayette Place, N. Y.

Established 1857.

The GREAT CHURCH LIGHT
FRINK'S Patent Reflectors for Gas or Oil, give the most **powerful, softest cheapest & Best** light known for Churches, Stores, Show Windows, Banks, Theatres, Depots, etc. New and elegant designs. Send size of room. Get circular and estimate. A Liberal discount to churches and the trade. *Don't be deceived by cheap imitations.*
I. P. FRINK, 551 Pearl St., N. Y.

Bailey's Compound Silver-Plated Corrugated Glass
REFLECTORS!!
A wonderful invention for **lighting** Churches, Opera Houses, Halls, Storerooms, etc. Latest and handsomest designs. **Satisfaction guaranteed.**
Plainer styles for manufactories. Send for Illustrated Catalogue and Price-List. **For Gas or Oil.**
BAILEY REFLECTOR CO.,
113 Wood Street, Pittsburgh, Pa.

AMERICAN AND GEM
SPRING HINGES.
Bronze, Brass & Iron,
In Various Styles, and SUPERIOR Finish.
Send for Catalogue.
VAN WAGONER & WILLIAMS CO.,
82 Beekman St., N. Y.

"Giant Metal Sash Chain."
MADE ONLY BY
THE SMITH & EGGE MANUFACTURING CO.,
BRIDGEPORT, CONN.

The most reliable and economical article in the market for the purpose. GREAT TENSILE STRENGTH Does not corrode; does not lose its vitality by continuous use, or exposure to the elements; runs over any pulley, and gives satisfaction wherever it is used. Fixtures made of steel wire, is very simple and easily applied. Prices very low. Samples sent to any architect in the United States, free, on application. Now in use in State House, Hartford; Providence City Hall; Singer Building, Chicago; J. C. Flood's, Menlo Park, Cal.; Vancornlear and Florence Flats, New York; Boreel Building, New York; new State War and Navy Departments, and Patent Office, Washington, D. C.; *Herald* Building, Boston, and very many other fine buildings in all parts of the United States.

Moule's Earth-Closet.
MYERS
All China Water-Closet
In one piece with Trap combined.

DECECO
Siphon Water-Closet
and large Stock
PLUMBERS' SUPPLIES.
MYERS SANITARY DEPOT,
94 Beekman St., New York.

SAYLOR'S PORTLAND CEMENT.
Strongest, Cheapest, Best, and Always Fresh.
JOHNSON & WILSON, Gen. Agts.,
For Sale by all dealers in masons' materials. **91 Liberty Street, New York.**
Sole Agents for **Styrian Tool Steel,** for the United States and Canada.
Send for New Descriptive Pamphlet.

ARTISTIC GRATES AND FENDERS.
OPEN FIREPLACES.
Direct Importers and Dealers in
Foreign and Domestic Tile
of every description and make, including new and original designs solely our own.
Fire Irons, Andirons, Brass Plaques, Jardinieres, &c.
The largest assortment and most elegant show-rooms in America.
J. S. CONOVER & CO.,
28 and 30 West 23d Street, - - New York.